

September 14, 1929

A McGraw-Hill Publication

20 Cents per Copy

AVIATION

The Oldest American Aeronautical Magazine



THE N. A. A.
CONVENTION

THE NEW *Hexhangar*

STARTING THE *All-European* LIGHT PLANE TOUR

AIRPLANE Cylinder Grinder

Used by
Balk
Continental
Corten
Globe
Klemm
Leverett
Pritz &
Whitney
Wright
and others

TEASING off two-cycle thinwalled stock from a thin-walled airplane cylinder and grinding a mirror finish in the chosen degree of accuracy is one of the most difficult jobs in today's shops. These results are all the more remarkable when one considers it is automatically performed, and requires practically no guess work.

The work is held within the workhead so that the hole is ground absolutely at right angles to the grinding wheel and concentric with the sample shaft. Then the cylinder, the very heart of the engine, is machined to give as near as possible in 200% accuracy.

The Heald Machine Co.
Worcester, Mass., U. S. A.

HEALD
Grinding Machines
at Cleveland, Ohio
CAGE-MATIC,
SPLIT-UP,
50° SURFACE
and AIRPLANE
CYLINDER GRINDERS

Cylinder as built in
the workshop ready
for grinding.



HEALD

FOKKER lends Seven League Boots to Chicago....

From Chicago, consider a means, both of transportation, or the more reads of a connector, easier Universal Air Lines, to speed door-to-door the pace of travel, to do is now offering over the width of four Universal air lines most extensive "on-call service" at Chicago, at Cleveland, at Louisville, at Omaha, at St. Louis, at Kansas City, at Dallas, at Garden City. Universal passengers can the always to have 4 days in cross-continent travel. Universal air lines mean "make connections" *

To maintain that unequalled standard of service and travel luxury, Universal Air Lines exhaustively tested all available air transport equipment. Then, with the entire market from which to choose, Universal equipped its air lines with super-comfortable Fokker air liners, the finest in speed, comfort and dependability that money can buy.

Other outstanding air lines, renowned for "on-call" service, likewise use Fokker equipment, among them Texas Air Transport, Standard Air Lines, National Parks Airways, American Airways, Pan-American Airways, Western Air Express.

Write your name and address in the coupon below, and we'll send to the Fokker Travel Bureau, 111 Clinton of Commerce Building, Los Angeles, California, just a friendly stamp (or pay our mail postage) and let us send you our illustrated booklet, "With Air Travel Pays."



FOKKER AIRCRAFT CORPORATION OF AMERICA

Eastern: WHEELING, WEST VIRGINIA, and TETERBORO AIRPORT, HARRISON HEIGHTS, NEW JERSEY
Address business inquiries to NEW YORK OFFICE, 110 EAST 42nd STREET

Name _____

AVIATION'S EYES are focused on St. Louis *The Crossroads of the Air*



FAST to west, north to south, sweeping diagonally from one corner of the country to another, the major aerial highways of the nation meet at the "Crossroads of the Air." Just in the middle of the country, where transportation lines have always met—Aviation, too, has its focal center today. Toward this mid-continental crossing, Aviation's eyes are gazing now. In and around this natural center many mark the great developments of the industry. For, since Aviation is Transportation—for, long distance, complicated Transportation—its activity must be greatest where such transportation means are most, where the great air lines meet, and cross, and radiate.

So, to St. Louis, key city of aerial crossroads, have come one after another of the manufacturers, the transport companies and the service organizations—here to establish their headquarters. Here in St. Louis is opening the National Aircraft Exposition of 1939, the most important Aviation event of the year. Here, too, will come more and more of Aviation's business and manufacturing interests, in the locational advantages of Aviation's Natural Center become better known and understood.

Compressed, accurate facts regarding Aviation opportunities in the St. Louis District, and a special service, if desired, are available on application to

THE INDUSTRIAL BUREAU of the INDUSTRIAL CLUB
321 Laclede Street. — In Kansas City.

"Wings over the U. S. Air, Inc."
Flowers, birds, leaves, and
all blossoms make a happy
symbol to mark the 100 mile
to Kansas City, where you
will find the Crossroads of the Air.

1939 Goodwill Bazaar
Bullock's Bazaar
1939 National Aircraft Show

SAINT LOUIS

THE WORLD'S
ENDURANCE RECORD
broken in St. Louis, by Jackson and
Gibson, again demonstrating the superior
flight qualities of their aircraft, which is
conceivable to make this the greatest
Center of Aviation.

The CROSSROADS OF THE AIR

These BUILDERS ARE DEMONSTRATING *Axelson* ENGINES

TRAVEL AIR

AMERICAN EAGLE

COMMAND-AIRE

BOEING

LINCOLN PAGE

SWALLOW

CESSNA

FEDERAL

PARKS

SPARTAN



New improved Axelson Aviastar Engine is ready for installation in the finer planes and engines with all the speed, power, and reliability of previous power. The famous planes are being dimensioned with the Axelson. It represents tomorrow's standard—positive lubrication to every moving part, rigid construction, uniform valve clearance regardless of heat expansion—and many other features. A new booklet describing this improved engine is now ready for distribution. Ask for a copy.



Axelson Aircraft Engine Co.
Faster and Easier Flights
Center Building 81 and Boyle Ave.
Los Angeles, California
46-26630



Finishes, fabrics and other du Pont aircraft materials offer unlimited opportunities for the originality now so necessary in airplane styling.

Flashing Bodies—Luxurious Interiors

TODAY aircraft makers place new responsibilities on the manufacturer. Commercial air transportation calls for added passenger comfort. Not only must your shops progress in mechanical design—but now, they must also constantly improve in luxury and styling.

To manufacturers of airplanes, du Pont offers a complete line of aircraft finishes developed to meet these present-day demands. Reso-

ut in texture, ultra-modern in tone and color, and specially formulated for air service—they bring you significant advantages in competitive selling.

Your whole finishing schedule can be based on these scientific du Pont materials. Wing dope, Painters, Aircraft Enamels, Army and Navy Finishing materials and many other products are available in their highest stage of modern development.

And du Pont color experts will gladly cooperate with you in planning up-to-the-minute color schemes. The du Pont Color Advisory Service is in constant touch with aircraft styling in both America and Europe. Feel free to call on them for any advice or assistance.

Complete information on any du Pont product for airplane use will be furnished either by mail or by a qualified representative.



E. I. DU PONT DE NEMOURS & CO., Inc.

Industrial Finishes Division, Parkers, N. J.

2200 Elston Ave., Chicago, Ill. 312 California St., San Francisco, Calif.

Fleet Paint and Varnish Limited, Toronto, Ontario, Canada

AIR-TESTED FINISHES

De Post Dope—The de Post line of tank dope includes all types of tank dope and paint dope. They are all-weather formulas of remarkable durability—proven by use as tank dope in the laboratory. Paints and fabric finishes are available and the Navy has solved these problems for their requirements, available in a wide variety of highly visible colors.

De Post Paints and Enamels—The de Post line of aircraft paint and enamel includes: Dope and Paint, Seal Varnishes, Prestige Varnish and Aircraft Enamels.

MEMBER OF AERONAUTICAL



Distinctive luxuries, added comforts, now made possible by du Pont Pyralin and Fabrikoid—two materials uniquely suited to air service.

—Modern Styling that SELLS Aircraft

PRACTICAL refinements in cabin design and styling lead innumerable successes in selling to the modern market. Generous windows, smart accessories, rich upholstery—color, life and comfort everywhere—are essential in the modern plane, just as in the modern motor car.

In the styling of modern planes, du Pont Pyralin and Fabrikoid offer almost unlimited possibilities.

Extremely light, ideally da-

rable, and beautiful in the most modern sense, these materials fulfill every requirement of air service. Pyralin in various colors and effects provides magnificent cabin windows, instrument boards and wing lights of sober appearance and supreme serviceability. Complete information and as many pyralic wigs will be furnished on request.

Fabrikoid completely modernizes cabin fixings and upholstery.



E. I. DU PONT DE NEMOURS & CO., Inc.

DU PONT VISCOCOID CO., Inc.

320 Fifth Avenue, New York City

FABRIKOID DIVISION Newburgh, New York

lent lightness and toughness make it highly preferred for the air. And the design of the new Nemonene Aeroplane Fabrics exudes vividly the buoyancy and gayety appropriate to modern air transportation.

du Pont technical men will gladly cooperate in applying these materials to style your planes. Please write direct to the division concerned.

AIR-TESTED MATERIALS

De Post Fabrikoid—Strictly Fabrikoid is an air-tested material—highly suitable for aircraft interiors, instrument panels, etc. Nemonene Aeroplane Fabrics are new type light-weight fabrics research developed for use in aircraft interiors. They are made from carbon beat and treated with appropriate pyralin colors. Enhanced in diameter and texture.

De Post Pyralin—A strong, durable, light-colored, non-yellowing material, highly suitable for aircraft interiors. Used for window frames, instrument panels, wing lights and other uses.

CHAMBER OF COMMERCE

C.W. "SPEED" HOLMAN**FIRST with NATURALINE**

in the Gardner Cup Race May 31st



Flying a Laird, powered with a T-4 Wright Whirlwind motor and fueled with NATURALINE, "Speed" Holman flew the 468 miles to Indianapolis and return, in 2 hours, 58 minutes and 40 seconds—an average speed of 156 miles per hour.

"I opened the throttle wide," "Speed" said, "and kept her there all the way."

Mr. Holman, who is operating manager of the Northwest Airways, St. Paul, Minnesota, made a test with NATURALINE shortly before he entered the race and stated that it revved up his Hornet engine at least 60 R.P.M. And after the race he remarked that he believed NATURALINE was "the finest fuel available for aviation purposes at this time."

W.W. 1st

N A T U R A L I N E

Fueling "Speed" Holman's Laird

Mr. E. Roy Alexander, Race Manager, wired us after the race as follows:

GARDNER TROPHY RACE TODAY STOP NINE SHIPS STARTED FIVE FUELED WITH NATURALINE WINNING FIRST SECOND THIRD AND FOURTH PLACE STOP FIFTH SHIP FUELED WITH NATURALINE DOWN DUE TO FABRIC BLOWN OFF FUSELAGE STOP GREAT VICTORY FOR WONDERFUL FUEL CONGRATULATIONS.



Product of
NATURALINE COMPANY OF AMERICA
Chestnut & Smith Building
TULSA, OKLA.

**SYDNOR HALL****SECOND with NATURALINE**

W.W. 2nd

N A T U R A L I N E

ART DAVIS



W.W. 3rd

Sydnor Hall flew a Travelair, powered with a T-5 and fueled with NATURALINE. He dived onto the Parks airfield seventeen minutes after "Speed."

Mr. Hall also, was enthusiastic about NATURALINE. After the race in a letter to us he said, "I believe that this gasoline is the best gasoline made for aeroplanes at the present time. I particularly wish to emphasize the fact that NATURALINE is considerably lighter than the average and therefore should be especially adaptable for aeroplanes in which a minimum of weight is desirable."

Close upon Sydnor Hall's heels came Arthur J. Davis, flying a Waco powered with a T-5 Whirlwind and fueled with NATURALINE.

N A T U R A L I N E

ART DAVIS **THIRD with NATURALINE**

Then came John P. Wood two minutes later, in a Waco T-4, also fueled with NATURALINE.

A fifth plane fueled with NATURALINE, was forced down because the fabric was torn from the fuselage, forty miles from the finish. This was Irvin T. O'Dell's Cesna. Mr. O'Dell was in second place when the accident happened.

Five out of nine planes were fueled with NATURALINE, four of which took the leading places.



Fueling Sydnor Hall's Travelair



Fueling Art Davis' Waco

Pictures show the fueling of the different planes with NATURALINE

PRATT & WHITNEY



"HORNET"
and
"WASP"

AERONAUTICAL ENGINES HAVE
SRB BALL BEARINGS

As Standard Equipment at Important Points

SRB Ball Bearings have contributed their unexcelled ruggedness and reliability to every performance, altitude and speed record made by Pratt & Whitney "HORNET" and "WASP" Engines.

Such is the faith placed by Pratt & Whitney engineers in SRB Ball Bearings and the experience and reputation of the organization behind them. For the same reason, you will find the SRB product in other world-famous aviation engines including Wright, Curtiss, Warner, LeBlond, Veltz, and others.

STANDARD STEEL AND BEARINGS INCORPORATED
Division of BIRMINGHAM CORPORATION

Ball  **Bearings**

Pacific Coast Distributors—F. W. Orlitzky Co., San Francisco, Calif.

E. G. Mather Co., Los Angeles, Calif.

Macbeth Bearing Co., South Bend, Ind.



P. & W. "Wasp" 620 H.P. Engine

Get these Profits from Protection



Landing fields clear for landing. Thoughtless children and curious grownups can be kept off landing fields by a sturdy barrier of Page Fence. No need for pilots to risk crack up to avoid pedestrains.



Planes and supplies protected



One way IN or OUT—for EVERYONE

It is essential for safety that planes be accessible to supply mechanics and pilots. You can have complete protection for your planes with Page Fence—ensuring safety of supplies and materials.



Page protection for aviation fields gives a definite check on both employees and the public. One way in or out protects order—implifies discipline—and gives a positive control on equipment and material.

—on the next page read about Page Fence Association plan service

Let the Page Fence Association Serve You in Planning Protection NOW!



Experts on protection give individual assistance



There are two essentials to lasting fence service—

- 1. Good material
- 2. Expert service.

The Page Fence Association assures service service by men trained to meet LOCAL conditions.

America's
Wise Fence
PAGE
Quality Products
1871
Established
nation-wide service
through
53 service plants

"Investigate!"
Page Fence is a valuable
investment, and you can
have it for the asking.

Write the Page Fence Association 520
No. Michigan Avenue, Chicago, Illinois



This PROTECTION plan book
is yours—no obligation

"Boundary Lines" is an informative
book full of valuable facts on
boundary line protection. A
copy is yours for the asking.

PAGE CHAIN LINK FENCE

Galvanized or Coppered
Ornamental Wrought Iron

AVIATION
September 16, 1938

11

Vancouver to Mexico at 100 Miles an Hour!—Gas \$22.50



1350 miles in 13 hours and
7 minutes—in a stock model
Great Lakes Sport Trainer—
Tex Rankin at the controls
—take off at Vancouver—
sooth over the United States—
landing in Agua Caliente, Mexico
the same day—no stops—
only 75 gallons of gas—that's
Performance!

Exact counterparts of this
marvelous ship are now being produced
in Volume—engineered to the highest quality standards.



The Great Lakes Sport Trainer
is the outstanding value in the
light airplane field. Write for
new illustrated booklet and
complete details.



GREAT LAKES AIRCRAFT
CORPORATION CLEVELAND





U. S. FIRST



U. S.
1" Heavy Duty Drill
2000 RPM. Lead Speed
\$44



U. S. 6" Bench Grinder
3450 RPM. Lead Speed
\$34.50



U. S. 1" Special Drill
2000 RPM. Lead Speed
\$24



U. S. Disc Sander
2750 RPM. Lead Speed
\$85



\$53



U. S. Continuous
Grinder-Resaw Drill
\$150
(1 H.P.)

AVIATION
September 16, 1939

Every Parks-Trained Transport Pilot is in a well-paying position today

Aviation Has Plenty
of Money, But Not Nearly
Enough Skilled Flyers

So serious is the shortage of Licensed Transport Pilots that every man trained for this work at Parks Air College is working right now and being paid big money for his skill.

This shortage of Transport Pilots is getting more acute. Factories are making places and the public is buying more faster than pilots can be trained. Demand now and more are finding themselves vying with almost as many other job seekers paying as much as \$3,000 a year—more than the cost of the complete course—as soon as they complete their Transport Pilot studies.

Leaders in aviation, out of the circle of modern industry, know Parks Air College like a book. They know it to be

modern and complete in the most telling details. They know of no staff of long experienced pilots-instructors, the school that got transport approval from the United States Department of Commerce without a moment's hesitation for examinations.

Parks-Trained Pilots Preferred Where Others Meet Want

So widespread is this school's reputation for high standards and absolute thoroughness of training methods that its graduates quickly discover that Parks-trained pilots are preferred.

Leaders in aviation, out of the circle of modern industry, know Parks Air College like a book. They know it to be

modern and complete in the most telling details. They know of no staff of long experienced pilots-instructors, the school that got transport approval from the United States Department of Commerce without a moment's hesitation for examinations.

They know that all the school equipment, including the big fleet of open-cockpit and cabin planes, is new and kept up in the best of condition. They know that a man trained at Parks Air College has been TRAINED RIGHT, that he has the best instruction possible, that he is a man with an assured future in the air.

6,188 New Ships Each Year With Only 4,160 Pilots to Fly Them

The Commerce Department has just announced that new planes are being learned at the rate of 6,088 a year, new pilots at the rate of 4,156. That means there are only two-thirds as many new planes as are needed to fly these ships. It means that each year there are 3,932 ships forced to stay on the ground because the highly paid, highly skilled men needed to take them up are lacking. That's opportunity for you!

Get into aviation! It's one of the most fascinating things on earth today. It's chockful of future for men of foresight and, above all else, action. Aviation is the very backbone of this ever-growing work. Let your first step be the flying in and reading of the soapbox below. Now!



Longer Courses for School or Aviation

PARKS AIRFIELD, DEPT. 2447, EAST ST. LOUIS, ILL.
Midwest Aviation Chamber of Commerce of U. S. A.

Parks Air College has been granted by the Aerospace Branch, Department of Commerce, as an Approved Transport Ground and Flying School

MAIL THIS TODAY!

NAME	ADDRESS
STREET	CITY
STATE	ZIP
Please send me information concerning the following:	
1. Parks Air College	
2. Parks Airfield	
3. Parks Flying School	
4. Parks Ground School	
5. Parks Aircraft	
6. Parks Engineering	
7. Parks Engineering	
8. Parks Engineering	
9. Parks Engineering	
10. Parks Engineering	
11. Parks Engineering	
12. Parks Engineering	
13. Parks Engineering	
14. Parks Engineering	
15. Parks Engineering	
16. Parks Engineering	
17. Parks Engineering	
18. Parks Engineering	
19. Parks Engineering	
20. Parks Engineering	
21. Parks Engineering	
22. Parks Engineering	
23. Parks Engineering	
24. Parks Engineering	
25. Parks Engineering	
26. Parks Engineering	
27. Parks Engineering	
28. Parks Engineering	
29. Parks Engineering	
30. Parks Engineering	
31. Parks Engineering	
32. Parks Engineering	
33. Parks Engineering	
34. Parks Engineering	
35. Parks Engineering	
36. Parks Engineering	
37. Parks Engineering	
38. Parks Engineering	
39. Parks Engineering	
40. Parks Engineering	
41. Parks Engineering	
42. Parks Engineering	
43. Parks Engineering	
44. Parks Engineering	
45. Parks Engineering	
46. Parks Engineering	
47. Parks Engineering	
48. Parks Engineering	
49. Parks Engineering	
50. Parks Engineering	
51. Parks Engineering	
52. Parks Engineering	
53. Parks Engineering	
54. Parks Engineering	
55. Parks Engineering	
56. Parks Engineering	
57. Parks Engineering	
58. Parks Engineering	
59. Parks Engineering	
60. Parks Engineering	
61. Parks Engineering	
62. Parks Engineering	
63. Parks Engineering	
64. Parks Engineering	
65. Parks Engineering	
66. Parks Engineering	
67. Parks Engineering	
68. Parks Engineering	
69. Parks Engineering	
70. Parks Engineering	
71. Parks Engineering	
72. Parks Engineering	
73. Parks Engineering	
74. Parks Engineering	
75. Parks Engineering	
76. Parks Engineering	
77. Parks Engineering	
78. Parks Engineering	
79. Parks Engineering	
80. Parks Engineering	
81. Parks Engineering	
82. Parks Engineering	
83. Parks Engineering	
84. Parks Engineering	
85. Parks Engineering	
86. Parks Engineering	
87. Parks Engineering	
88. Parks Engineering	
89. Parks Engineering	
90. Parks Engineering	
91. Parks Engineering	
92. Parks Engineering	
93. Parks Engineering	
94. Parks Engineering	
95. Parks Engineering	
96. Parks Engineering	
97. Parks Engineering	
98. Parks Engineering	
99. Parks Engineering	
100. Parks Engineering	
101. Parks Engineering	
102. Parks Engineering	
103. Parks Engineering	
104. Parks Engineering	
105. Parks Engineering	
106. Parks Engineering	
107. Parks Engineering	
108. Parks Engineering	
109. Parks Engineering	
110. Parks Engineering	
111. Parks Engineering	
112. Parks Engineering	
113. Parks Engineering	
114. Parks Engineering	
115. Parks Engineering	
116. Parks Engineering	
117. Parks Engineering	
118. Parks Engineering	
119. Parks Engineering	
120. Parks Engineering	
121. Parks Engineering	
122. Parks Engineering	
123. Parks Engineering	
124. Parks Engineering	
125. Parks Engineering	
126. Parks Engineering	
127. Parks Engineering	
128. Parks Engineering	
129. Parks Engineering	
130. Parks Engineering	
131. Parks Engineering	
132. Parks Engineering	
133. Parks Engineering	
134. Parks Engineering	
135. Parks Engineering	
136. Parks Engineering	
137. Parks Engineering	
138. Parks Engineering	
139. Parks Engineering	
140. Parks Engineering	
141. Parks Engineering	
142. Parks Engineering	
143. Parks Engineering	
144. Parks Engineering	
145. Parks Engineering	
146. Parks Engineering	
147. Parks Engineering	
148. Parks Engineering	
149. Parks Engineering	
150. Parks Engineering	
151. Parks Engineering	
152. Parks Engineering	
153. Parks Engineering	
154. Parks Engineering	
155. Parks Engineering	
156. Parks Engineering	
157. Parks Engineering	
158. Parks Engineering	
159. Parks Engineering	
160. Parks Engineering	
161. Parks Engineering	
162. Parks Engineering	
163. Parks Engineering	
164. Parks Engineering	
165. Parks Engineering	
166. Parks Engineering	
167. Parks Engineering	
168. Parks Engineering	
169. Parks Engineering	
170. Parks Engineering	
171. Parks Engineering	
172. Parks Engineering	
173. Parks Engineering	
174. Parks Engineering	
175. Parks Engineering	
176. Parks Engineering	
177. Parks Engineering	
178. Parks Engineering	
179. Parks Engineering	
180. Parks Engineering	
181. Parks Engineering	
182. Parks Engineering	
183. Parks Engineering	
184. Parks Engineering	
185. Parks Engineering	
186. Parks Engineering	
187. Parks Engineering	
188. Parks Engineering	
189. Parks Engineering	
190. Parks Engineering	
191. Parks Engineering	
192. Parks Engineering	
193. Parks Engineering	
194. Parks Engineering	
195. Parks Engineering	
196. Parks Engineering	
197. Parks Engineering	
198. Parks Engineering	
199. Parks Engineering	
200. Parks Engineering	
201. Parks Engineering	
202. Parks Engineering	
203. Parks Engineering	
204. Parks Engineering	
205. Parks Engineering	
206. Parks Engineering	
207. Parks Engineering	
208. Parks Engineering	
209. Parks Engineering	
210. Parks Engineering	
211. Parks Engineering	
212. Parks Engineering	
213. Parks Engineering	
214. Parks Engineering	
215. Parks Engineering	
216. Parks Engineering	
217. Parks Engineering	
218. Parks Engineering	
219. Parks Engineering	
220. Parks Engineering	
221. Parks Engineering	
222. Parks Engineering	
223. Parks Engineering	
224. Parks Engineering	
225. Parks Engineering	
226. Parks Engineering	
227. Parks Engineering	
228. Parks Engineering	
229. Parks Engineering	
230. Parks Engineering	
231. Parks Engineering	
232. Parks Engineering	
233. Parks Engineering	
234. Parks Engineering	
235. Parks Engineering	
236. Parks Engineering	
237. Parks Engineering	
238. Parks Engineering	
239. Parks Engineering	
240. Parks Engineering	
241. Parks Engineering	
242. Parks Engineering	
243. Parks Engineering	
244. Parks Engineering	
245. Parks Engineering	
246. Parks Engineering	
247. Parks Engineering	
248. Parks Engineering	
249. Parks Engineering	
250. Parks Engineering	
251. Parks Engineering	
252. Parks Engineering	
253. Parks Engineering	
254. Parks Engineering	
255. Parks Engineering	
256. Parks Engineering	
257. Parks Engineering	
258. Parks Engineering	
259. Parks Engineering	
260. Parks Engineering	
261. Parks Engineering	
262. Parks Engineering	
263. Parks Engineering	
264. Parks Engineering	
265. Parks Engineering	
266. Parks Engineering	
267. Parks Engineering	
268. Parks Engineering	
269. Parks Engineering	
270. Parks Engineering	
271. Parks Engineering	
272. Parks Engineering	
273. Parks Engineering	
274. Parks Engineering	
275. Parks Engineering	
276. Parks Engineering	
277. Parks Engineering	
278. Parks Engineering	
279. Parks Engineering	
280. Parks Engineering	
281. Parks Engineering	
282. Parks Engineering	
283. Parks Engineering	
284. Parks Engineering	
285. Parks Engineering	
286. Parks Engineering	
287. Parks Engineering	
288. Parks Engineering	
289. Parks Engineering	
290. Parks Engineering	
291. Parks Engineering	
292. Parks Engineering	
293. Parks Engineering	
294. Parks Engineering	
295. Parks Engineering	
296. Parks Engineering	
297. Parks Engineering	
298. Parks Engineering	
299. Parks Engineering	
300. Parks Engineering	
301. Parks Engineering	
302. Parks Engineering	
303. Parks Engineering	
304. Parks Engineering	
305. Parks Engineering	
306. Parks Engineering	
307. Parks Engineering	
308. Parks Engineering	
309. Parks Engineering	
310. Parks Engineering	
311. Parks Engineering	
312. Parks Engineering	
313. Parks Engineering	
314. Parks Engineering	
315. Parks Engineering	
316. Parks Engineering	
317. Parks Engineering	
318. Parks Engineering	
319. Parks Engineering	
320. Parks Engineering	
321. Parks Engineering	
322. Parks Engineering	
323. Parks Engineering	
324. Parks Engineering	
325. Parks Engineering	
326. Parks Engineering	
327. Parks Engineering	
328. Parks Engineering	
329. Parks Engineering	
330. Parks Engineering	
331. Parks Engineering	
332. Parks Engineering	
333. Parks Engineering	
334. Parks Engineering	
335. Parks Engineering	
336. Parks Engineering	
337. Parks Engineering	
338. Parks Engineering	
339. Parks Engineering	
340. Parks Engineering	
341. Parks Engineering	
342. Parks Engineering	
343. Parks Engineering	
344. Parks Engineering	
345. Parks Engineering	
346. Parks Engineering	
347. Parks Engineering	
348. Parks Engineering	
349. Parks Engineering	
350. Parks Engineering	
351. Parks Engineering	
352. Parks Engineering	
353. Parks Engineering	
354. Parks Engineering	
355. Parks Engineering	
356. Parks Engineering	
357. Parks Engineering	
358. Parks Engineering	
359. Parks Engineering	
360. Parks Engineering	
361. Parks Engineering	
362. Parks Engineering	
363. Parks Engineering	
364. Parks Engineering	
365. Parks Engineering	
366. Parks Engineering	
367. Parks Engineering	
368. Parks Engineering	
369. Parks Engineering	
370. Parks Engineering	
371. Parks Engineering	
372. Parks Engineering	
373. Parks Engineering	
374. Parks Engineering	
375. Parks Engineering	
376. Parks Engineering	
377. Parks Engineering	
378. Parks Engineering	
379. Parks Engineering	
380. Parks Engineering	
381. Parks Engineering	
382. Parks Engineering	
383. Parks Engineering	
384. Parks Engineering	
385. Parks Engineering	
386. Parks Engineering	
387. Parks Engineering	
388. Parks Engineering	
389. Parks Engineering	
390. Parks Engineering	
391. Parks Engineering	
392. Parks Engineering	
393. Parks Engineering	
394. Parks Engineering	
395. Parks Engineering	
396. Parks Engineering	
397. Parks Engineering	
398. Parks Engineering	
399. Parks Engineering	
400. Parks Engineering	
401. Parks Engineering	
402. Parks Engineering	
403. Parks Engineering	
404. Parks Engineering	
405. Parks Engineering	
406. Parks Engineering	
407. Parks Engineering	
408. Parks Engineering	
409. Parks Engineering	
410. Parks Engineering	
411. Parks Engineering	
412. Parks Engineering	
413. Parks Engineering	
414. Parks Engineering	
415. Parks Engineering	
416. Parks Engineering	
417. Parks Engineering	
418. Parks Engineering	
419. Parks Engineering	
420. Parks Engineering	
421. Parks Engineering	
422. Parks Engineering	
423. Parks Engineering	
424. Parks Engineering	
425. Parks Engineering	
426. Parks Engineering	
427. Parks Engineering	
428. Parks Engineering	
429. Parks Engineering	
430. Parks Engineering	
431. Parks Engineering	
432. Parks Engineering	
433. Parks Engineering	
434. Parks Engineering	
435. Parks Engineering	
436. Parks Engineering	
437. Parks Engineering	
438. Parks Engineering	
439. Parks Engineering	
440. Parks Engineering	
441. Parks Engineering	
442. Parks Engineering	
443. Parks Engineering	
444. Parks Engineering	
445. Parks Engineering	
446. Parks Engineering	
447. Parks Engineering	
448. Parks Engineering	
449. Parks Engineering	
450. Parks Engineering	
451. Parks Engineering	
452. Parks Engineering	
453. Parks Engineering	
454. Parks Engineering	
455. Parks Engineering	
456. Parks Engineering	
457. Parks Engineering	
458. Parks Engineering	
459. Parks Engineering	
460. Parks Engineering	
461. Parks Engineering	
462. Parks Engineering	
463. Parks Engineering	
464. Parks Engineering	
465. Parks Engineering	
466. Parks Engineering	
467. Parks Engineering	
468. Parks Engineering	
469. Parks Engineering	
470. Parks Engineering	
471. Parks Engineering	
472. Parks Engineering	
473. Parks Engineering	
474. Parks Engineering	
475. Parks Engineering	
476. Parks Engineering	
477. Parks Engineering	
478. Parks Engineering	
479. Parks Engineering	
480. Parks Engineering	
481. Parks Engineering	
482. Parks Engineering	
483. Parks Engineering	
484. Parks Engineering	
485. Parks Engineering	
486. Parks Engineering	
487. Parks Engineering	
488. Parks Engineering	
489. Parks Engineering	
490. Parks Engineering	
491. Parks Engineering	
492. Parks Engineering	
493. Parks Engineering	
494. Parks Engineering	
495. Parks Engineering	
496. Parks Engineering	
497. Parks Engineering	
498. Parks Engineering	
499. Parks Engineering	
500. Parks Engineering	

BACK
IN 1908
THE U. S.
RUBBER CO.

— + —
FIRST

MANUFACTURED PNEUMATIC +
AIRPLANE TIRES + + +
"TO HELP YOU FLY"

More than 20 years ago, when a 40 mile wind was sufficient to keep the hardest pilots on the ground — when most planes were launched from special runways and, if lucky, landed on skids of oak or ash —

it was when the United States Rubber Company demonstrated its ability to manufacture the first pneumatic tires for aircraft. The first tires, like offshoots were the *an a/c* "Westinghouse" — purchased by both Wright and Curtis of the first American Aero Show in 1908.

Heavier tires soon followed and, in 1912 there was published an advertising folder which was entitled "To Help You Fly" and which listed three class of airplane tires in addition to other flying necessities.

Today at all U. S. dealers you will find a complete range of airplane tires in all standard sizes with

Boeing Model "75", Boeing Air Transport, Inc.—
Equipped with United States Airplane Tires.

UNITED STATES
AIRPLANE
TIRES



AN EXCERPT FROM THE ABOVE ADVERTISING FOLDER
DESCRIBING THE *an a/c* "WESTINGHOUSE AIRPLANE" TIRE

"Anticipating the increased size and weight of airships to
the new future we have designed the tire to be used well."

either plain or non-skid tread. Every one of these tires is of West Card construction which gives the strongest and most durable structure that can be built. West Card fabric, while not this company can effect, is a development of our own research laboratories and is used in all Westinghouse aircraft tires in the world. And to top with the established U. S. policy, the facilities of these laboratories are at all times available to manufacturers for the working out of any aviation problem wherein rubber plays a part. A letter will bring a prompt response.

UNITED STATES RUBBER COMPANY



Reduce the Noise with **MICARTA Propellers**

THE din and roar of the propellers constitute one of the annoyances of aerial transportation. Propellers differ, however, and a remarkable difference is noticeable in ships equipped with Micarta propellers.

This quietness of Micarta blades is due, primarily, to the fibrous character of Micarta which results in absorption of the vibrations caused by torque and thrust irregularities—the common cause of flutter.

Micarta propellers are made of fabric treated with a synthetic bond and are molded to exact dimensions, with correct angle, track, width and thickness to attain the highest efficiency. They are unaffected by atmospheric conditions, salt water spray, or oil. The pitch may be adjusted to suit flying conditions.

Write for detailed information on Micarta products for the aviation industry.



WESTINGHOUSE ELECTRIC & MFG. COMPANY
EAST PITTSBURGH, PENNSYLVANIA
SALES OFFICES AND SERVICE SHIPS IN ALL
PRINCIPAL CITIES OF THE UNITED STATES

Westinghouse

Aircraft accessories

Micarta Propellers
Micarta Control arm Pulleys
Micarta Fairleads
Micarta Tires
Micarta Bearing for Cabin Padding
Micarta Tilt and Wheel

Aircraft Lighting Equipment

Chesterfield Landing Field Flashlights
Boundary, Approach and Observation Lights
House Lights
Reflector
Transformers and Motor generators



For Happy Landings

BY **design** of design and the perfect combination of the soundest principles of aerodynamics the Whittemore Avian gives a flying performance that no other light plane can approach. Among points it is recognized as the outstanding plane for racing and sports. The secret to it, she soars so high.

In the air its stability is remarkable. And added to the safety inherent in the design of the ship are the Hadrill-Pope wing slots which eliminate danger of spins and permit lower landing speed.

No plane is easier to land. Andampionship airmanship with its constantly wide track is steady, resilient and welcome to cross country racing when landings must often be made on rough fields.

Invest in a Whittemore Avian. Its economy of operation will save you money. Its inherent stability and flying qualities will hurry the sales right.

To Dealer and Distributor

When you fly or sell the Whittemore Avian you have something to talk about. No other light plane has such a record of performance — or the equipment. Numerous breakdowns in the leading aviation centers of the country. Dealers and distributors are still being appointed. Write for further information concerning our sales plan. We will gladly send you the detailed story of the plane itself. The Whittemore Manufacturing Company, Dept. A-3, Bridgeport, Conn.

EXCLUSIVELY MADE — For sale Avian, England to America, America to England. Avian light plane makes a light sensi-



plane, latest type, England to India; first on any light plane to Rome.

SPECIFICATIONS — Power Plant, Cirrus Mark III 91 H. P. air cooled, four cylinder in line aircraft engine. Top speed at 3000 ft. flying hours 30 miles to gal. of gas., 100 miles to gal. of oil. Speed, Maximum, 105 m. p. h. — Climbing, 65 m. p. h. in landing, 35 m. p. h. — Climbing, 1000 ft. in 50 sec. — Service ceiling, 14,000 ft. — Weight, Empty, 1711 lbs.; Loaded, 2140 lbs. — Total, 1800 lbs. — Dimensions: Wings span, 28 ft.; Width, folded, 55 ft. — Height Overall, 7' 6"; Length Overall, 16' 8". — Price, Only \$4950; Flying at T. O. B., Bridgeport, Conn.

WHITTELESEY AVIAN



THE OUTSTANDING SPORT AND TRAINING PLANE OF THE WORLD

In the New Continental Engine



CERTAINLY every part on an airplane engine deserves to be called a "first" part. But if there are some parts more than others that require the most exceptional care in manufacture, and material of the highest quality obtainable, these parts are the cylinder barrels.

The Continental Motor Corporation has selected Bethlehem Steel forgings made from Bethlehem "Airplane Quality" Steel for the cylinder barrels of the new Continental Aircraft Engine.

Bethlehem Steels and forgings are extensively used by builders of aircraft and engines. Their contribution to the success of the Continental Aircraft Engine is amply foreshadowed by the number of endurance records and other exploits, made by planes whose engines had cylinder barrels or other important parts made from Bethlehem forgings and "Airplane Quality" Steels.

The new 7-cylinder Continental Aircraft Engine, with cylinder barrels made from Bethlehem "Airplane Quality" Steel.

BETHLEHEM STEEL COMPANY, General Offices: Bethlehem, Pa.
Agents: NEW YORK, Boston, Philadelphia, Pittsburgh, Washington, Atlanta, Indianapolis, Cleveland, Detroit, Chicago, Cincinnati, St. Louis, San Francisco, Los Angeles, Seattle, Portland, San Francisco, and Honolulu.
Bethlehem Steel Aircraft Corporation, 31 Broadway, New York City.

BETHLEHEM

FORGINGS



**"AIRPLANE QUALITY"
STEELS**

THE AVIATOR'S GREATEST PROTECTOR

BEYOND his own courage and skill, what serves as the aviator's greatest protector? The answer is dependable power... an engine that responds perfectly to every requirement, to every emergency in the air. Such dependability is an integral part of Continental Red Seal Airplane Engines. This, together with lack of vibration due to proper proportion in design and balance embodies the best principles evolved during 28 years' specialized experience in designing gasoline motors, of which Continental Motors Corporation is the world's largest producer.

The result is confidence... confidence of the aircraft manufacturer who installs them... confidence of the aviator who rides the skies in a Continental-engined plane.

CONTINENTAL MOTORS CORPORATION
AERONAUTICAL DIVISION
Offices and Factories: Detroit, Michigan, U.S.A.



Continental Engines

AVIATION

THE OLDEST AMERICAN AERONAUTICAL MAGAZINE

A MUNSWELL PUBLISHING COMPANY

EDWARD P. WARNER, Editor

Volume 14 • September 14, 1929 • Number 11

On Talking Facts

CONSPICUOUS among the papers presented at the recent joint technical meeting of the Society of Automotive Engineers and the Aeronautical Chamber of Commerce in Cleveland were three which indicate a trend of the times. Three authors quite independently undertook to make economic analyses of problems of engine design and operation. Laying aside any preconceived prejudices at general assemblages, they set out to think the answer by arithmetic.

The problem is a growing one, but it is not growing rapidly enough. Aviation has passed the centesimal stage. What we need now is a campaign of fuel-finding. Such matters as a choice of the speed at which an aircraft should operate, the price that can properly be paid for the saving of weight, either in the airplane structure or in the engine, the number of cents per gallon by which we are justified in increasing the price paid for fuel in order to reduce the consumption by a definite amount, or to secure a definite increase in the power output of a given engine; those and many other topics of which they are typical, can easily be solved only with the aid of pencil and paper and slide rule or adding machine. The rule of judgment based on experience is obviously not to be despised. It is indispensable but judgment must have some scientifically known data to use as an anchor and a foundation for its exercise.

Those engaged in the aeronautical industry, as well as we who are in aeronautical publishing, are mathematicians about the terms of air transport. If we were not we should be in some other business. But aeronautics is not a substrate for knowledge. To reflect the indifferent section of the general public with our own enthusiasm and to inspire them with the desire to take to flying on their own account is very necessary. For our own sake, and in order that we may render the public the best possible service after they have been persuaded to think about taking advantage of it, it is equally important that we give analytical answers to one problem. Evasion is the driving power behind the aeronautical industry and its progress, but the result of a perfectly

coldblooded and hardheaded study of the facts and figures, lead where they will, is the steering gear. The more rapidly such studies are made, and the more truly the industry as a whole exchanges the information derived from them, the less likely any of us are to waste energy by running off the track.

II

Country Business

FARM RELIEF is more closely allied with the development of aviation than many members of the aeronautical profession and most members of the political profession have realized. Farm relief is a phase and a political issue. No oversight legislation will bring automatic prosperity to the agriculturist. Rather will prosperity, and advancement of farming as an industry, come through the increased application of more efficient protection and marketing methods. Then comes the universal adoption of the most modern machinery and the airplane is probably the most modern of all machines.

Gasoline motors and mechanical soaring, racing, bieling and threshing machines have already revolutionized methods of agriculture. The employment of the truck and automobile has greatly simplified marketing problems, making possible wider and more efficient distribution of farm crops. The telephone, radio and automobile has drawn the isolated farm closer to our national life, and now the airplane will destroy the last barrier of isolation and bring city and country into close and constant contact. Aircraft are prime instruments of the water spaces. Men man in cities for more rapid communication and mutual co-operation. The airplane will bring these benefits to men whose daily interests demand that they live at greater distances apart.

One western producer having now halidately flies directly to the ranches with which he does business. In one day he has made personal visits to and purchases

from ranches in the Imperial Valley of Southern California and the San Joaquin Valley of Northern California, situated hundreds of miles apart, amalgamating their and giving personal supervision to work which would have required the attention of several men without the airplane.

Crop marketing is one phase of the airplane's possibilities. Others, such as crop dusting, surveying, crop inspection, and general transportation over a large area, series of ranches has been recognized for some time. Further possibilities arise almost daily.

Whenever the city dweller will prove the great source of traffic over established inter-city air transport lines, it is in the country dweller that we must look for the immediate use of the small and specialized forms of aircraft. Prosperity for the builders of automobiles has long rested ultimate on the purchases of the large population, and the same is likely to prove true for builders of airplanes. Those with their interests centered in a city have neither the room for operation nor the incentive to use small aircraft. Country folk have both and the intelligent recognition of this lies in the American aircraft industry will be a leading factor in assuring the continued growth of the figures of airplane production and sales.

//

THE AERONAUTICAL CHAMBER of Commerce has just been meeting in its several sections at Cleveland. Its program of discussion was full to overflowing. Among the subjects on the docket were some that affect virtually every company in the industry, and every individual employee. It is deplorable that so little attention was devoted by a majority of these persons to Cleveland. The apparent indifference of a large part of the industry to its collective interests is shameful.

When we find that less than one-third of the non-military airplane manufacturers belonging to the Chamber of Commerce are represented at a meeting called for the express purpose of discussing their problems, we can realize of two explanations. Some of those who ought to be present are having as much difficulty in getting up with their own business that they have no possibility of finding time to consider anyone else's troubles or the industry's common problems. Others, among the smaller producers, no doubt feel that the big fellows will reach the decisions and decide the collective policies anyway, and that it would be a waste of time for them to participate or even to attend the discussion.

Both groups are wrong. When a man is so busy with his own affairs that he has no time to consider his relations with the rest of his industry and the rest of the

world trouble lies just over the horizon. There is something wrong with a manufacturing company that continues it's war to have won one of its principal expenses a meeting for the discussion of the Department of Commerce regulations under which next year's machines will have to be designed and built. There is something strong with a manufacturer who does not care to get first-hand information upon a discussion of the standard discounts to be given on purchases of engines, or who does not take pains to have his own views ready for expression.

As far as the notion that the small companies have no influence in such a meeting that they might as well stay away, if they use it is their own fault. The good presentation of a good case counts for as much as a meeting of the automobile industry anywhere else. The decision finally reached by such gatherings are usually unanimous or nearly so, but agreement comes only as a result of free discussion and discussion cannot be wise unless the discussion is broad and representative.

It will be felt that there were too many competing interests at Cleveland, but there was nothing that deserved pre-eminence over the workings of the Chamber of Commerce. The sessions were interesting and valuable but that will continue to be true in the future only if the industry studies it's case. A large measure of the aircraft industry's future prosperity and of its claim upon the public's confidence will depend upon its demonstrating ability to co-operate. The meetings of the Chamber has the co-operation of co-operatives. The Chamber is entitled to more than lip service from its members. They are what a member of them already are, tools, giving a real participation in its work. Its readings must be a genuine forum of the industry's views upon its problems. They must not be allowed to sink into sterile and apathetic annual sessions for the indoctrinating through of pre-arranged programs.

//

Commercial Helium

AUGUST saw the shipwreck of the Graf Zeppelin first around the world, with an across-crossing of the Atlantic thrown in and with another about to be started as the month closed. The stricken ship from Berlin, the fruit of seven years of study and effort, took the air. The two new British rigid airships are at the point of readiness for trial. The Los Angeles gave the new public demonstration of the process of hooking a plane onto an airship in flight and carrying loose cargo. At the Cleveland Airport perhaps for the first time in history, four "blimps" maneuvered in formation. After years of doubt and persistent pessimism the last public is becoming enthusiastically shipwrecked.

AVIATION

September 16, 1939

But there will be commercial operation of rigid airships no longer afraid of challenge. We believe that capital will be forthcoming to support intercoastal operation of lighter-than-air craft. We believe very confidently that our citizens are ready to purchase them. Airships will be designed and built and ready to be flown but what are we going to fill them with?

In America that question admits of but one answer. The Zeppelin Company has used hydrogen successfully and with substantial safety for many years, but even the Zeppelin interests are beginning to look with longing eyes upon a non-inflammable gas, and to expand the desirability of making some small sacrifice in lifting power to secure its great advantage in safety. Captain Lehmann, commanding the Graf Zeppelin on its most recent crossing of the Atlantic, has been quoted in the last two weeks as an advocate of helium inflation. Our own experience with that gas has now been long enough so that no other reasons any serious consideration. When to helium inflation we add the installation of Diesel engines, using a fuel not capable of taking fire in ordinary carburetors and by any ordinary means, we shall finally attain fire lesser from airship transportation than it can be, but where shall it come from?

The most important field of helium-lifting gas, located in northwestern Texas, is under the control of the Bureau of Mines. The wants of the Army and Navy are supplied, but the Bureau of Mines is hardly likely to go into the business of manufacturing helium for general commercial trade. The Bureau has not, to put it conservatively, given any enthusiastic assurance to commercial companies who are in the field of helium production. Their work could hardly have been made more difficult. If it were not for the Navy Department's awards of commercial contracts for the supply of helium at a time when the Bureau of Mines production was temporarily about shut down, there would be no commercial industry today, and the Los Angeles would have had to be laid up for a considerable period.

Three years ago, when there was no commercial helium production, it was being generally assumed in Washington that the Government would ultimately withdraw from the business, confining its attention to a continuation of the research work which had already proved so valuable and to the exploitation of new fields, and leave routine production to those who would make a business. Now the beginning of an industry exists, and it is getting very encouraging.

The position of three years ago was right. An attempt open or covert, direct or indirect, to maintain a Government monopoly in helium production is wrong.

As a matter of general policy, the Government ought not to be in the business of manufacturing and commodity. Helium should be no exception. The manipulation of gas and of companies to starve the industry, so that there may be not nearly one but several producers, with the purchaser's interests protected in the usual

business by competition should become a fundamental of our policy. There is nothing more important as a preliminary to putting the airship to work commercially. As a defense step for the conceivable future, the War and Navy Departments should make it a rule, even at some temporary sacrifice in cost, to fit at least half their belief demands in the commercial market when gas is available on reasonable terms. To say nothing of the benefit to commercial operation to come in the long run that will be good government economy.

//

The New Mexico Tragedy

IT IS TOO EARLY to make any technical comments of value on the ends on the slopes of Mount Taylor which cost eight lives last week. That must await the official inquiry, and the release of further evidence bearing upon first causes. Expressions of sympathy, however, are never premature in such a case, nor are some general observations about the attitude that we should take in the face of disaster.

Safety has been a great problem—most greatest—from the very first days of organized industry and organized transportation. Safety is to be increased, in the air as well as in the factory and in persistent analysis of the causes both of actual accidents and of theoretically possible accidents and then by eliminating those causes one by one. For example the danger of fire in the air is open enough has not been entirely eliminated, but it has been reduced to a minor fraction of what it was ten years ago as a result of the patient experiment and study carried on during that period by the Army Air Corps at Wright Field and by a British committee on fire hazards. The essential is, then, that no accident should pass unexamined and that we should examine the last bit of information from each one in order that there may be no recurrence.

When sensational accidents happen the popular reaction often borders on panic. This is the time for us to remain ourselves, and to remind the non-aeronautical public so far as we can that safety is concerned with aerostats over a reasonably long term. As used it is no less safe this week than it was last month. Rather the reverse. It is still true that the hazards of travel on well-managed air lines are, and have been, shown by experience to be, small. No effort will be spared to make them smaller.

To the relatives and friends of the crew and passengers of the City of San Francisco and to the officials of Transcontinental Air Transport, to whom safety has been the object of constant thought and care, it would be impudent to speak of consolation. We can only, and we do after our very profound sympathy to all concerned

ONE AND ONE-HALF ACRES

of Hangar Floor Space

By CHARLES F. McREYNOLDS

UNDER ONE ROOF

REvolutionary in design and of massive size, the all-steel-and-concrete hexagon-shaped Hangar recently erected on the new Los Angeles terminal field of Western Air Express, Inc., marks the first big step in a definite trend toward the development of airport buildings designed to meet the complex needs of air line operations. And lines have developed their "road houses," steamship lines their floating dry docks, and bus operators their special service pits for overhaul and servicing of equipment, just as to the time that the "Herrnhuter" was conceived and built by the William Farnes Company, now as then had been content with large rectangular structures not to be removed from the land and docks which cradled much of aviation's early development.

Containing 34,000 sq. ft., or one acre and a half of floor space under one roof, the Western Air Express Hangar was designed to simultaneously service six of the 32-passenger, four-engined DC series Fokkers soon to be placed in operation. This giant building is 280 ft. in diameter, and has six sides, each measuring 40 ft. It will have an unobstructed floor area of 123 ft. by 30 ft. high. Each of the six sections of the building is an equilateral triangle 143 ft. on a side, and the entire building will house either six DC Fokkers, 18 F-10 Fokkers, 18 St. Boerig or Douglas twin planes all at one time and if necessary many small planes can be stored in the hangar along with the six DC's.

Some conception of the size of the hangar is given by the statement that there are 203 tons of structural steel more than \$2 tons of corrugated iron sheeting, and

1,500 yd. of concrete used in its construction; the total cost of the building being \$750,000 or \$1.69 per sq. ft. of floor area. Not one stick of wood is used in the structure anywhere.

With Western Air Express, Inc., recently decided to abandon Viat Field and construct an entirely new terminal on a site near Alhambra, C. C. Cole, superintendent of operations for all Western Air Express lines suggested that a special service hangar be developed for the new field. William Farnes, president of the William Farnes Contractors Company, the leading Southern California contractors concerned the site of ground the planes to be served about a central control point. Taking this site the design for the Hangar building was developed by A. M. Edelman and A. C. Zanuckson, associated archi-

tects and the contractor for this hangar and the consulting development of the field was awarded to the William Farnes Company. This company has now applied for basic patents on the Hangar and is specializing in airport design and airport building construction. Wide interest has been aroused in the new type hangar both in this country and abroad, and more buildings of this type will probably be erected on other airports under development

the conventional type building and at the same time a much undivided floor is obtained with roof piers of shorter span than the longest span girder in the Hangar being 82 ft. This type of structure is naturally well braced, particularly against violent winds and the shape of the building reduces wind hazard because there are no sharp corners or large blade walls to catch the wind.

Each of the six sides of the Hangar is effectively

composed by 400 ft. door

openings which fit into

Pontoon aircraft hangar

doors in two 10-ft. units and

two 15-ft. units, rolling each

way to a blade width so as to

permit all doors to be open

at the same time without interfering with each other.

Two of the units have small

gates down in them for the

use of persons entering or

leaving the hangar when all

the doors are closed. Although

the doors may be quickly

closed by a handle, they are

stabilized by a catch which will make possible the throwing open of all

six doors simultaneously by operating one switch on the central control panel. Approximately two-thirds of each door is devoted to window glass, these having a total of 6,800 paces of Safety obscure glass plus glass in the entire building: 6,000 paces in the doors alone and a total window glass space of 4,076 sq. ft. All door units are equipped with rubber weather strips to completely seal the hangar against weather with the doors closed.

In developing this hangar it was considered that the purpose of the hangar is to house aircraft which let out planes to be leased in a triangle location of the stations which are common to all airports. At least four servicing bays seemed desirable to group these triangular units about a central point in order to simplify handling of supplies and the location of working personnel. Eight units of a hexagon of octagon shape, were first considered, but it was found that much space would be wasted in the octagon type because the section area would be longer than the door openings, whereas all conventional planes have a greater wing span than fuselage length. A pentagon, or five-sided figure seemed ideal from the stand point of area per plane housed, but this shape was abandoned in favor of the hexagon because of the symmetry of a hexagon which makes it easier to hold corner bracing, able to handle one more plane with little sacrifice in corner space and too because the hex building is easier to plane and better looking.

Because of the unobstructed structure resulting from supporting a symmetrical hexagon shaped roof it is possible to use considerably lighter steel throughout than in

the concrete floor of the hangar has a slope of 15 ft. from center to circumference, making it possible for one to ride the largest plane out of the hangar door to road or air ground. All roofing on roof and side is made with copper having galvanized corrugated iron sheathing. The roof is so constructed that 90 per cent of all water falling on it drains to the center and down to an aerial beneath the hangar floor.

Contribution of all units, accessories, storage, etc., is the chief feature of the hangar. In keeping with this idea there is a hexagon shaped building at the center, 40 ft.

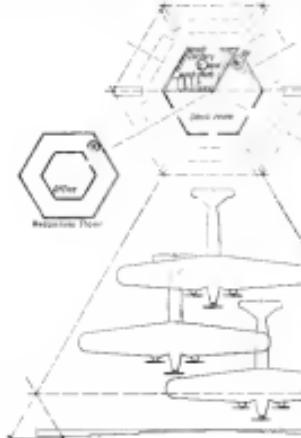


"Hexagonal" hangar at the Los Angeles terminal field for Western Air Express
by William Farnes Company



In diameter, one-third of which is occupied by lavatory and locker rooms, and two-thirds by a stock room. Above this stock room building is a mezzanine floor reached by a spiral staircase. The entire structure is surrounded by a building and an observation platform running completely around this office for the use of the shop superintendent in supervising service operations. In this central building an electric panel is located which controls all lights or electric motors in the building. Installation of plumbing fixtures and electrical equipment is greatly simplified by the manner in which all pipes and conduits are centralized from one point. In each of the six sections of the hangar there is a small service pit containing air water, and electric power outlets, gas, water air and electric outlets are also provided from each of the six main control pilers which are located 20 ft. out from the central building.

On the other features of the hangar roof is an 8-ft. deep center 80 ft. in diameter just above the central office building and a building. This building is 20 ft. deep all the way around the center of the hangar above the 20 ft. level, thus flooding the center of the building with indirect light. Skylights are also provided above each work bench and above the central office. The vertical center windows are of pivoting type and in addition there are twelve 36-in. pivoting windows located on the roof to protect against gas fumes. Six red observation lights are mounted along the outside diameter of the hangar roof and six beacon lights are mounted, one on each point of the roof. In addition there are six floodlights on the ground which light the building at night to render it more clearly visible from the air. As a



ABOVE: Front view of the center of the hangar. LEFT: Ground plan with perspective showing accommodations for three transport planes in each service



further aid to visibility the entire hangar, roof, doors and walls is being painted with 15-ft. orange and black squares.

Painting is being done by IBM-Hedding's Moestolinic paint, which is waterproof and impervious to the weather. The entire hangar interior is heavily sprayed with aluminum paint for weather protection and better lighting.

Complimentary fire fighting equipment is installed

an exterior pressure tank being connected to a number of outlets within the building, any of which may be attached for reaching the fire area.

During construction of a storage hangar the Western Air Express is using the Heddinger for both storage and service. Just as soon as possible, however, it will be cleared of everything but service equipment. The plan calls for every Western Air Express plane to go through the service hangar and storage after each run. The storage function is of course, not construction consisting, it is said, to give a building of parallelogram form with three planes occupying stalls on each side of the building.

Many economies in servicing result from the use of one hangar. Most important is that the supervisor is close to all work being done, and can supervise all operations without leaving his second story office.

Next in importance is the fact that all supplies and tools are exploited from all work each man having a minimum distance to walk for the needed tool, where in the ordinary type hangar he might walk three times as far, which when repeated many times adds greatly to labor cost. Another important fact is that the work soon is close at hand and the minimum of time is lost in moving it. All work benches are concentrated around the central building, and it is recommended that when possible, two or three workers be assigned to each bench, so as to increase working time. Another factor is that servicing such as on batteries, rangefinders, wireless, etc., can be concentrated at a separate bench to advantage and costs from each plane may be brought to the special bench or workmen. It is also possible to specialize



ABOVE: Interior view showing the method of releasing doors, and the basic method of closing space to close when closed. BELOW: Interior view showing position of planes in one section of the hangar.



in service operations in certain segments of the hangar as, for instance, in the present hangar one section is equipped with an overhead walkway and water outlet which permits a worker to wash the entire upper portion of the plane's wing by using the long handled water hose operated from along the walkway.

Another advantage in conducting service operations in one hangar and in having a separate building for engine overhauled or wing and fuselage repair is found in the fact that the service building can be equipped with many special stands used in servicing which would be of no use for any other operation. Also more complete mechanical service requires many special tools which are best kept in a separate shop. In the near future a separate wing and engine repair shop building will be erected adjoining the present service hangar.

The hexagon shaped service hangar provides just the right sort of odd corners for placing of benches, and

cupboards, where they will not be in the way as is often the case with the rectangular hangar.

The shape and arrangement of the hexagon permit trucks to be placed into the hangar and then to proceed in or out by means of a center alleyway without difficulty. The approximately circular shape also permits placing the hangar in odd corners of landing fields, which are always present when cross runways are laid out on rectangular fields. In fact, from the swinging angle there seems to be no saving advantage in the hexagon or circular type of hangar than that form of building is sure to be very carefully selected in an low altitude.

For high altitude operations the hexagonal field is much in favor of the Heddinger also. By paring down off each segment of the hangar it is possible to rent at least as cheaply per plane as space can be rented in any other hangar, plus the advantages to the private owner of having a centrally located shop room and a central parts and supply room, perhaps operated by a separate company, which would efficiently supply all hangar needs. From the storage standpoint, the outstanding characteristic of the Heddinger is the accessibility which it provides, making it possible to move any plane without moving any other, something that is impossible with the conventional type hangar.

Considering all of the advantages made available by the hexagon type of construction a comparison of costs in aggregate per annum is of unusual interest. The officials of the William Bass Construction Company do not believe it possible to erect the ordinary first-class hangar of wood construction for much under \$30 per square foot of hangar floor area according to figures recently published, while the Heddinger for the Western Air Express, with complete equipment and the finest construction and finish that could be desired, was erected at a cost of \$1.69 per square foot. Figuring depreciation over a period of years, they consider that steel and concrete construction must be granted to be the cheapest, to say nothing of lowered fire hazard and increased efficiency of the building.

STARTING THE All-European

By EARL D. OSBORN

LIGHT PLANE TOUR



There: A group of Belgian aviators stand by their plane. Capt. Broad ready to take off in his cockpit.

OFFICIALS who think that there are difficulties in connection with running the Ford Reliability Tour will appreciate the amount of organization necessary to run the Challenge International de l'Aviation. The tour, which this year was conducted by the Aero Club of France, started from Orly, near Paris, carried the contestants on a 3,907-mile trip through twelve different countries, each with its own customs and language. Originally there were 88 applicants for entry from ten different countries. Any tour is difficult to manage, but under no circumstance the effort is little short of stupendous.

This international light plane tour is very direct evidence of the increasing importance which Europe is placing on the development of the light plane. Last year no country except England had adapters light planes, and the tour itself did not go outside of France. Also there were many less entries. However, it is being more and more realized by the various countries that the cheaper and more practical way of having a reserve of military fliers is to encourage the development of private flying. The fact that these planes, which are the result of government encouragement for military purposes, are the ones most popular, should be compelling in more or less friendly rivalry, brings out clearly the international financial aspects of aviation.

The actual number of planes which showed up at Orly before the dead line at noon on Aug. 3 was 35, representing eight different countries. The largest representation was that of Germany with 8 B.F.W.'s, 6 Klemm's, 3 Junkers, 2 Riall-Katzenstein's, 2 Albatross's, 1 Arado, 1 D.R.D. (Dornstadt-Altenrhein), Fluggruppe, and 1 Poco-Wolf, making a total of 24 planes. Italy had twelve machines; 4 Fiat's, 4 Officine Pomeranei Membriente (Rome), 3 Brooks, 1 Cavigliari Navile Trieste. France had nine; 5 Potes, 3 Caudries 1



Goucches. Also entered under the auspices of the Aero Club of France were 2 St. Huberts (Belgium), 2 Moths (Ireland), 1 Jarras-Morberwick (Jugo-Slav). Czechoslovakia had 2 Avias and 1 Aero, while Switzerland had 2 Klemm's. The United States was represented by a few scientific observers.

Entries were made through the Aero Clubs of the various countries and practically all the planes partic-

ipating were sponsored by their manufacturers. All the contestants were required to carry two people. There were two classes, one for planes weighing up to 616 lb. capacity for three, and up to 860 lb. capacity. The winner of the competition was listed on the following in which speed as aerial flight was the chief consideration. The maximum number of points which could be gained by any contestant was 165, divided as follows: practical qualities of the plane, 49 points; greatest consumption, 20 points; regularity, 35 points; speed, 70 points. No points were given for qualities of take-off or landing and so a rough several of the German machines were really special racing planes.

The points granted for the practical qualities were divided as follows: strength of construction, instruments and landing gear, 8 points; self starter, 3 points; drift control, 7 points; parabaticles, 3 points; fire extinguisher, 6 points; folding wings, 3 points; for reliability (various parts of the engine and plane being tested), 30 points; not changing propeller, 3 points; not changing a wheel, 1 point; 100, 40 points. These points to be assigned by a committee of judges representing the various aero clubs.

Finally to give the tour more of the aspect of a race and partly because it would have been impossible to handle all of the planes on some of the smaller airfields at one time, contestants were allowed to cover more than one stage a day. There were 25 compulsory stops, but others were allowed without permission except that speed was figured on elapsed time between fixed stops only. The controls were open from seven in the morn-

The tour of Europe, of which the opening stages are described by Mr. Osborn, continued successfully to its close with thirty-five machines among the forty-three starters reaching the finish. It represents a phase in an energetic effort to promote the idea of private use of light air planes for touring in Europe. Both in the plan of the tour and in the design practices shown in the machines entered there was much to interest the American industry.

ing until eight at night, and to give the full 35 points for regularity contestants had to cover at least one lap each day. The maximum time for completing the course was eight days, and the minimum was fourteen. The average length of the legs was about 160 miles, the longest being 300 miles and the shortest 75 miles. Due to passport and customs difficulties, it was expected that there would be considerable delays when going from one country to another. There were also persistent rumors that certain countries would not allow fliers from certain other countries to land at all. In any event, there were four military zones in the direct route, over which the fliers were not allowed to pass. Changes in course often forced the contestants to land to negotiate the arriving of the planes after the zone had ended. The landing of the planes at Orly was excellent. The machines were landed on the asphalt runways, which are regulation concrete buildings over 500 ft. long, 150 ft. high and 300 ft. wide. The 30 contestants plan only occupied about one-third of one of the hangars. The planes of the various nations were grouped together, and each type was given a letter in addition to its number, so that they were easy to identify. The presence of weighing, judging the practical qualities, and the consumption tests were carried on with a thoroughness which



Quarantine hangar at Orly where the planes were housed before the race.

was a great credit to the organization of the Friends Aeronauts Club.

There were twenty different types of planes which arrived in time for the opening of the meet. All but one were two-seaters, a type which is only beginning to receive general attention in the country, and in this case suitable exceptions such as the Moths and the Ringers were the only one or less experimental machines. By the time that many of these had only been completed and that they had not been proved over a series of years in practical commercial operation. The Europeans are accustomed to very small low-powered cars and it may be that there will be a market abroad for the smaller of the two classes of planes listed in the table, but it is hardly likely that they will fill a popular demand in America. A plane weighing only 600 lbs. is a pretty small affair and many of these planes were not large enough to seat comfortably a full-sized passenger. The power plants in these smaller planes ranged from 40 to 80 hp., and while the latter a 100-hp. plane should have plenty of room.

The planes were very diverse in natural characteristics in the planes. Most all of the German planes were wing monoplanes, the Italians were all high-wing monoplanes, the only two British entries were biplanes, while the French had examples of both. The German Moths are well known in this country, as they are built by the



British-Built Moth, D1489, at the 1928 Cleveland meet.

Aeronautics Plane and Motor Company. The R.E.W.s is very similar, except that the wing is slightly more upward and smaller. The three all-metal Junkers were structurally the most interesting and pleasing machines at the meet, but the fuselage was too small for comfort and the wing was rather thin and of small area, so that the take-off did not seem to be satisfactory. After the landing gear of one of these collapsed while taking across the field. The other German planes were built of steel tubing or girders and were distinctly experimental in their design. They showed strong signs of wear, though they had no German drivers and were not planned to look at. One of the most interesting was that of the Albatrosche Flugzeugwerke D-38. It was a true cantilever biplane with a much stiffer that the leading edge of the lower wing was to the rear of the trailing edge of the upper wing. This arrangement gives excellent stability, and apparently the plane had a good take-off and low fuel consumption combined with considerable speed.

The French Potez is a two-seater resembling one of an

enlarged Monoslope, rather crudely built, but comfortable to sit in and selling for \$2,000. The Grafen, after having built a high-wing monoplane for several years, is now building a low-wing machine which, though not especially pleasing to look at, gives the appearance of being substantial. The Grafenbach was a fair imitation of a Cessna, but built entirely of plywood. At the present time there are new types and building comes and experiments.

The Italian machines were those which had been developed to Italian light plane competition. They were all of the high-wing externally-braced type, and looked like primitive machines. The price for which an order for 300 was placed by the Italian government, seemed rather high and well back through the design, gave the impression of being a little old-fashioned. The wing bracing extended over the pilot's head, allowing the fuselage to be cut away for ease of entrance to the seats.

WHEN ALL IS SAID AND DONE, however, the two Moths were the most workable and practical of all the machines in the tour and certainly they have the advantage of having proved their practical value and having already gone through their testing troubles. It will be interesting to see the final results of the meet, and it will be interesting to see if the Moths will do well. [Mr. Collier's management was of course surprised and forewarned just as the tour was starting. One of the Moths piloted by Captain Broad actually made the fastest time around the circuit. Results of the tour will be found in the Foreign news section.—Ed.]

In construction most of the planes were built of plywood with wooden wings. None of them was fitted with slats or with flaps. Rather cords or disks were more common than ribs in the landing gear. All the engines were air-cooled, and the majority of them were radial. Most of the planes were fitted with spooling tubes, but only a few of them with parachutes.

The flying of the tour was done in large part through the extensive fuel plan by the various starting area clubs. The first tour was about \$4,000, the second \$3,000, and the third about \$3,000 and there were several stops of about \$500 each. The various areas along the route are given special prices and marks of the manufacturers of planes and parts are giving special prices at their products or plane.

Out of the 30 planes which arrived in time to enter, only 43 actually started. Some of the entries were overweight, some failed in the gasoline consumption trials, and several were of such an experimental nature or had been so recently completed that minor or major troubles occurred. One German machine collapsed in the air while starting the pilot being killed; one crashed on landing when the pilot did not recover from a sideslip, and one collapsed its landing gear while taxiing.

For the competition tests and for the actual start of the tour the planes were taken up in pairs and the machines in the lower weight class, seemed heavier-powered. On the whole the biplanes seemed to get off and climb better than the monoplanes. Several of the machines took long runs and did not start until they had flown for half, or three-quarters of a mile. It was obvious that many of the designers had built planes which, though efficient, were not suitable for the amateur flier who needs ample reserve power. It is most unfortunate that there were no American entries, as the tour is a real test both of the planes and the pilots.

THE N. A. A. CONVENES

The National Aeronautical Association, in the Annual Settlement of its Affairs, Re-elects Senator Bingham

THE National Aeronautical Association held its eighth annual convention in Cleveland on Thursday, Friday and Saturday at the week of the races. The convention of which the first session was actually attended by about one hundred fully accredited delegates, was presided over by national trustee. Approval of the work done by the present administration and a vote for the association of the contents of its policies, which the chairman of the nominating committee proposed in submitting his report, appeared to be generally shared by the delegates.

The incoming committee, presided over by Dr. George W. Lewis of Washington, brought in the name of Senator Hiram Bingham of Connecticut as the only candidate for the presidency. These being no other nomination from the floor, Senator Bingham was unanimously elected. The present executive committee, Robert V. Collier, chairman, was also chosen for another term.

Col. B. F. Castle, chosen as treasurer of the association at its last convention and reelected for seven years in that office, had made known to the nominating committee that his new industrial responsibilities would make it impossible for him longer to devote attention to the work. To succeed him the committee proposed John F. Vassar of Washington, assistant secretary of the National Aeronautic Committee for Aeronautics and presiding officer over the present convention and various sessions of its predecessors. For secretary, G. E. McDowell of California was nominated. In every case the committee's nominees were unanimously approved.

As governors at large, three of the present board were reelected together with two new members. To the names of Charles Wright, Godfrey L. Luker and Daniel E. Adams there were added those of William MacCracken Jr. and Benjamin F. Collier. Mr. Collier nominated the floor for the first. The plan to provide a representative in the group for the Pacific Coast. Secretary MacCracken offered to withdraw his name in order that the Pacific Coast might be represented, but Mr. Rankin after consideration decided to withdraw his name rather than this pro-*per* his selection in place of any of the five men already named. In doing so he expressed an earnest hope that the nominating committee would provide for representation of the Coast territory in the future.

The work of the national nominating committee concluded, governors for the various states were announced from the floor as the chairman of state delegations. In most instances the present state governors were reelected.

In a brief speech of acceptance and appreciation of the action of the convention Senator Bingham expressed his determination to give to the association all of the



SENATOR HIRAM BINGHAM, left, elected president of the N. A. A. Collier, executive committee member.

time that his public duties permitted, and regretted that it had been difficult for him to find the opportunity of visiting the chapters as he would have desired to do during the past year.

Senator Bingham had spoken at considerably greater length on the opening day of the convention, reporting on the Association's work during the past year. A lengthy address was delivered by Col. Paul Henderson who dealt especially with the necessity of keeping the industry on a firm foundation and insuring a safe course, herein dangerous arrogation and unfair competition or pessimism.

The resolutions committee, as on several past occasions was headed by Collier. L. Collier of Boston was president of the Association and brought in a total of twenty general resolutions in his two reports.

It is an acute apprehension to the work of N. A. A. they recommended, among other things, that a new and comprehensive plan should be evolved for unifying the national states so provide for adequate compensation to the N. A. A. for its services and for its proper identification with the races and their conduct a special committee of three to be appointed to study the matter. Another resolution requested that the contest committee draw up a clear and complete statement of the conditions governing the conduct of competitions in general and another directed that the committee give study to the subject of permanent claims for arbitration by interested parties and to the possible durability of presenting means of clearing or authenticating them.

In the more general field the resolutions called for the construction in the Federal government of a model airport at Washington, for a more liberal support by

Congress of the five-year program of the Army and Navy, which were declared to be needed with full military Readiness appropriations, and commended the three assistant secretaries of War, Navy and Commerce for their work in their own departments and especially for their cooperation. The resolution pledged the Association's support to their efforts.

Another resolution conveyed the felicitations of the Association to Dr. E. L. Gammie, and urged upon the Navy Department the importance of supporting an American aircraft carrier. Another resolution of the good wishes of the convention to Mr. Lester Adams, the president in 1927 and 1928, and expressed regret over his unfortunate inability to attend. Mr. Adams had been present at every previous convention since the inaugural one at Detroit seven years ago. The Association took formal action approving the participation of the Federal Government in the International meeting called in Paris by the International Commission for air navigation three months ago and urged that the State Department should use all proper methods to promote such modifications in the International Convention as would make it acceptable for ratification by the United States. Another resolution bore upon the same topic, with special reference to the importance of American participation in the making of international rules for the division of air traffic into areas, or the selection of international air routes. Most of the resolutions were approved by the convention without material change. One which occasioned much discussion, and which was finally laid aside, was the proposal to the board of governors to study the subject and draft a resolution. This was very long. It expressed gratification at the government's interest in aircraft performance and especially in their commercial use, approved the actions by federal and congressional committees that had made the advances possible, and specifically recommended the extension of the present airway system and the provision of at least one good airport in each city.

SPEAKER BISHOP told that the resolution as drafted was ambiguous and might be taken as indicating that the association would support the federal government's hold airports for all other. Various amendments were suggested as making it clear that it was the municipalities that were being urged to act in this respect. The president of the Association said further, however, that he believed that the K.A.A. should concentrate all its efforts in Washington on the five-year program. He briefly reviewed the bitter struggle to get through each year the appropriations that the program called for, and the relevance that the Bureau of the Budget and the House of Representatives had displayed in granting the full amount necessary, especially for the Army program. He further warned the convention that Congress was becoming nervous about the rising costs for army expansion and maneuvers, and suggested that the state should be urged to build their own airways and especially to open in emergency landing fields scattered over their area so that a pilot in trouble could always be sure of having a landing field within a few miles. He took as an example the situation in which the state of Oregon had the major share of the cost. After further discussion the whole matter was tabled, with instructions that resolutions to be prepared by the board of governors should comply with the suggestions made by Senator Brigham.

Another resolution conveyed the felicitations of the Association to Dr. E. L. Gammie, and urged upon the Navy Department the importance of supporting an American aircraft carrier. Another resolution of the good wishes of the convention to Mr. Lester Adams, the president in 1927 and 1928, and expressed regret over his unfortunate inability to attend. Mr. Adams had been present at every previous convention since the inaugural one at Detroit seven years ago. The Association took formal action approving the participation of the Federal Government in the International meeting called in Paris by the International Commission for air navigation three months ago and urged that the State Department should use all proper methods to promote such modifications in the International Convention as would make it acceptable for ratification by the United States. Another resolution bore upon the same topic, with special reference to the importance of American participation in the making of international rules for the division of air traffic into areas, or the selection of international air routes. Most of the resolutions were approved by the convention without material change. One which occasioned much discussion, and which was finally laid aside, was the proposal to the board of governors to study the subject and draft a resolution. This was very long. It expressed gratification at the government's interest in aircraft performance and especially in their commercial use, approved the actions by federal and congressional committees that had made the advances possible, and specifically recommended the extension of the present airway system and the provision of at least one good airport in each city.

Some discussion was had over the present percentage of military personnel except in 1927, of holding the annual convention in conjunction with the National Air Races. The membership committee unanimously suggested that the convention be held in Washington at the time of the National Air Races. The spring meeting of the voluntary at Langley Field. It was also proposed that instead of the rates took too much of everyone's time and especially of that of the local members, to permit of their giving attention to the convention, the convention might be held in the same city with the national races but about two weeks earlier.

The K.A.A. private flying club plan was explained to the convention both by J. Brooks Parker, and by the brokerage firm handling the insurance, and by the writers' chairman of the private flying club committee. The financial aspects of the scheme were explained in greater detail, and the questions that had been most commonly asked and the objections that had been frequently raised in correspondence were answered from the platform. It was reported that only two charters had so far been wholly awarded but that several more were in the process of being chosen and that the formation of a number of other clubs was anticipated for the next future. Various firms in the aircraft industry have shown marked interest and the desire to cooperate actively.

Shortly after noon on Saturday, the convention, with no more business to come before it, adjourned sine die

A few other resolutions were rejected after consideration, because they appeared to the convention of insufficient importance to justify expense of the Association's efforts, or because of questionable legal feasibility of making the action that had been suggested. One was specific for the use of less or no explosives in the maintenance of any gas holder to reduce risks as to their whereabouts. This is of course already covered in part by sections in the Air Commerce Act prohibiting the maintenance of a false or misleading air navigation entity. Another proposal that was voted down would have called for the removal of any gas tax on fuel used in airplanes.

The resolution committee further brought in, at the last scheduled sum of the convention's business, a resolution of appreciation to Colcord Castle for his long and efficient services as treasurer, to the City of Cleveland for its hospitality, and to the Cleveland chapter, and especially to Floyd J. Logan, for their share in conducting the air races.

OTHER COMMUNITIES REPORTED, and addressed were made from time to time. Glen W. Gerson of Washington presented the report of the committee on N.A.A. hospitals. The committee recommended the certificates and the granting of the right to display the Association's insignia, to any hospital in such any which undertaken to set aside a room for the use of the N.A.A. membership, providing trip maps, weather reports, etc., to grant space for chapter and other meetings, and to make special arrangements for furnishing accommodations to N.A.A. members at all times. About ten hotels, including the Cleveland in Cleveland, the Ambassador in Los Angeles, the Carlton in Washington, the Fontainebleau in Omaha, and the William Penn in Pittsburgh have already been approved by the committee. A number of hospitals in other cities, including Boston, Baltimore, Atlanta, and Seattle have accepted the requirements but have not yet been formally accredited.

Some discussion was had over the present percentage of military personnel except in 1927, of holding the annual convention in conjunction with the National Air Races. The membership committee unanimously suggested that the convention be held in Washington at the time of the National Air Races. The spring meeting of the voluntary at Langley Field. It was also proposed that instead of the rates took too much of everyone's time and especially of that of the local members, to permit of their giving attention to the convention, the convention might be held in the same city with the national races but about two weeks earlier.

The K.A.A. private flying club plan was explained to the convention both by J. Brooks Parker, and by the brokerage firm handling the insurance, and by the writers' chairman of the private flying club committee. The financial aspects of the scheme were explained in greater detail, and the questions that had been most commonly asked and the objections that had been frequently raised in correspondence were answered from the platform. It was reported that only two charters had so far been wholly awarded but that several more were in the process of being chosen and that the formation of a number of other clubs was anticipated for the next future. Various firms in the aircraft industry have shown marked interest and the desire to cooperate actively.

Shortly after noon on Saturday, the convention, with no more business to come before it, adjourned sine die

IMPRESSIONS OF

Olympia

By JOHN R. CAUTLEY



IT WAS UNFORTUNATE for me, American, to witness that portion of the Olympia Show which revealed the detailed study of the London Show which would have been of much greater interest in the techniques of aviation. These, therefore, are general impressions which are subject to the errors due to lack of data for thorough study.

Olympia might be compared to two Chicago Coliseums, along-side each other, and another extension is in process of erection. In general this allows the exhibition of machines in a most adequate way, and the balconies form vantage points for bird's-eye views which are a great help in observing the machines.

Another point is the facilities for obtaining food which are totally lacking at all American shows. But the eating places along about the show are in a predominantly military character. In a general way the machines exhibited might be divided: (1) Military, (2) Political, (3) Sport, (4) Commercial.

1. Military

THE FIRST CLASS model of experimental aircraft and the aircrafts of the various aerobatic have by this time been completely described, so that they may be passed over with a few general comments. The pursuit machines would appear to be ahead of those built in the U. S. A. and are very definitely designed for a high

speed at 20,000 feet, which speed one is given to understand it is in the neighborhood of 300 m.p.h. This will take some heating.

Most of the planes are conventional, but the Vickers low-wing monoplane is a most interesting design. No details are available, but the all-metal structure, rather high split trailing gear and general cleanness of outline make the performance well worth watching.

The Parry ships are noticeable for their sleek appearance.

In general the larger military land machines do not stand up in a military picture as a whole, but have many interesting details.

The big six flying boats stand out. First as always designed by people thoroughly imbued with naval ideas, second as being extremely slow and lumbering and lacking in launching deck on the water third, as having a tremendous amount of heating, rigging, etc., which certainly cannot add to speed, but may be necessary to assure the second item. It will be most interesting to see whether these large boats can be cleaned up in appearance during the next few years and if such cleaning does not aid performance materially.

2. Political

THIS IS NECESSARILY a peculiar classification, but a definite one. In this class fall ships as the Fairey long-distance machine. A splendid effort, but used only as a means of engine testing, and should not be fully evaluated. Flying for hours such as Hawker Page and Armstrong Siddeley build. They are passenger and mail liners, it is true, but their main purpose is again long-distance navigation in time of peace. Probably out of these will grow the main support for the British aircraft industry, and it is a pity that more firms have not tackled this problem.

Finally, attached to this class, but having nothing to do with the first commercial (although the extremes of the half world accommodate a racing gunn all the better) is the Blackburn "Safe" Flying

Biplane. The biplane alone is shown, but it is beautifully finished and looks both clean and beautiful. If the rest of the structure is to clear up the completed biplane should give a very fine account of itself.

A. Start

WE have around all about them. Light planes! Fine planes for training, probably good for the refresh short distances in Great Britain, but not a business proposition or a solid foundation for a great industry. The automobile had to become basically a business vehicle and a necessary means of transport before it grew great.

4. Commercial

A few instances of what would be called commercial planes are shown. In other words, four-seaters or larger, 200 hp. or more, closed cabins, single or multiple



Black two-passenger open cockpit biplane, leading gear

engines, and so on, stretch of the imagination military or naval machines.

A. V. Roe has frankly taken a lesson from Fokker at Amsterdam. They have a very good-looking three-cylinder, full-seat Fokker, and when one night off a scale model seating four and mounting three Salmson Gnome engines. Perhaps the author thinks planes and the automobile should be developed just as far as this, as well as the Westland three-engined plane, should do very well.

But another has a striking speed of over 100 mph., which would appear fast for the man who is going somewhere.

The above as well as the other examples, show definitely that developments in the U. S. A. have not gone unobserved. Whether they have been completely observed, and possibly improved upon, or successfully, and interestingly used, world wide detailed study and a lot of flying to find out.



Black "Kangaroo" flying boat, with single-seat hull and nose

Before leaving the planes at large, the author must recall Sander's Flying Boat recommends itself to the eye at least in its clean surface. The engines above the monoplane wing are unconventional from an English or American viewpoint, but this position has the support of both German and Italian constructors. Here again the top speed of 105 mph. is quite consistent with present day practice but might be witnessed to advantage.

Random Shots

LEAVING THE AIRCRAFT SECTION of the show one is confronted by a large number of interesting things which are possibly best covered in a series of numbered numbered notes.

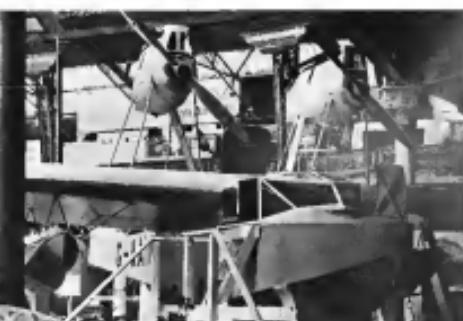
Engines, of course, come first.

Unfortunately, the showmen, some of the foremost American technicians were at the show, and this observer is really afraid to make comments which would be taken to his credit, those better informed. [Professor C. F. Tietze and the engine exhibits at length in *Aero-News* for Aug. 20—1929]. It would appear in general that one of the Atlantic's radial is not living long all its own way, but this type, with reduction gears, low and high duty superchargers, and various types of cooling, is giving the fluid-cooled engine a real run for their money. There were no examples of Ethylized Glycerol cooling noted, but such studies can be in the secret list. The only radically different engines were two-wheeled-gear designs. Such have been tried before, and these will have to be proved thoroughly before they attract general interest.

In detail plane design all interest is directed toward metal construction. However, the British designers are in general and consistently opposed to refined fuselages.

There is a wide divergence of opinion as to the relative merits of steel and dural. Since we all dural, so we both metals and some all steel. It would appear that steel in ground, and it is believed that an airplane designer could have spent the whole period of the show most profitably studying the various methods of construction and especially the variations in design and fabrication which grow out of the use of one or the other. The fixtures and machines for forming must have taken much ingenuity and thought in their development.

To an American, the landing gear design of the smaller British machines was surprising. A number of different makers retain the straight axle which has accompanied them in the U. S. A. Whether America has



Black monoplane, early work, four passenger monoplane, Birkett with two 100 hp. Bleriot engines. Left: Vickers all metal four-seater touring plane, propeller plane. The monoplane above are from the early days of the Vickers monoplane

technical societies were more elaborate and interesting, both from an historical and an engineering viewpoint. Considerable space would be required for proper comments on the Olympia Show, and they are left for these better qualified.

The show was thoroughly international in its scope and one was sorry that the American representation was so small. Much of the Continental European industry was represented by engines and the plane side was for the most part substituted by models and photographs.

The writer's imagination was exercised by the Dornier Stand, where a line model of their Graf Zeppelin was shown, with numerous photographs of the boat itself, both at rest and in flight. It is a most inflationary construction and apparently very well earned out.

One point might again be emphasized and that is that American design, given much time in getting to such a stage, is not far off this, we are shown, apprehensive, but there is much hard fair thought in results, which could hardly be transmuted by any articles or reports.

Conclusion

over-emphasized the split landing gear for specific purposes is a point for argument.

Generally, the straight axle can be made light and the wheel motions on landing are much easier on the wheels and tires. Other gears are practically universal, and it is to be regretted that more time was not available for the use of straight axles.

Due to the military character of the show, split-axle landing gears in single-seated machines were not as prevalent as in the U. S. A. This, of course, was not due to the use of straight axles.

British are just beginning to wake themselves (it is in both senses of the word). There were approximately twenty machines so listed and this observer might be accused of attempting to advertise if he stated the numbers of the various makers.

Exhibitions have not apparently taken hold of the designers' imagination to any great extent, and no outstanding examples were seen.

The exhibits of the military establishments and the

THIS COMMENT on the show has been written in an attempt to indicate the very different problems confronting British designers in particular from those faced by designers in America. There is demand, and the domestic market for commercial machines, that there is in the U. S. Weather conditions are unfavorable, distances are short, the population is less, and the country is not so geographically. There should be a great market growing out of the potential type of machine, and a good one for what has been termed the partly commercial type in the commercializations to and in the existing portions of the Commonwealths of the Empire.

It is hoped that numbers of British aircraft industry may be able to take advantage of these potential markets and may the reward which their hard work thoroughly deserves.

Ford Motor Company AND AMERICAN

By JOHN T. NEYLAND.

AERONAUTIC DEVELOPMENT

*Ford Air Mail Lines Are
Inaugurated; the Company
Demonstrates Radio for
Planes; Henry Ford Flies
with Lindbergh*

IF THE YEAR 1927, financed by the Lindbergh flight to Paris, will be remembered as that point in aviation history when the business of flying gained a foothold in America, surely the year 1926 can be said to have given the industry a foothold on the initial of this nation's commerce.

That was to be concealed, II, as less than 100,000 car load and is the heaviest of American air transport. For, beginning with the Fairly-operated Detroit-Chicago and Denver-Cleveland road routes, which began service on Feb. 15, 1926, regular schedules proved so successful that the government began to go into operation in various parts of the country. The western section of operation of the Post road routes was provided by that of a several-year contract route, such as the Seattle-Vancouver route (Oct. 15, 1929), the New Orleans-Pittsburgh route (Aug. 1, 1932), and the Pittsburgh-Bethel, Alaska route (July 1, to June 30, 1933) but they were not regularly operated domestic routes. The former two routes were placed in operation principally to handle mail to and from stations and their operation was discontinued when the schedules of each route. By the end of the year there was a total of twelve air mail routes in operation, all of which were operated under private contract. The remaining one, of course, was the government-operated transcontinental route between the coast

These routes, including the transoceanic route, covered altogether 6,634 mi., and were as shown in Fig. 1.

invented by the nation's contract survey system by private contractors. The system had a total of 38 station stages and more than 2,000 m (all included in that portion of the transcontinental route between New York and Salt Lake) had been hauled by eight flying

These and many more of which entered passenger and other routes devoted solely to passenger traffic which had begun to spring up, began to cause the market toward which Henry Ford had looked when he entered the aeronautics field. The company has since found a large marketing field. The American and Canadian governments, in private corporations not regarded as a part of the aviation industry, and in individuals, but there can be little doubt that in past and present sales to aircraft operating companies have been and are continuing to be demonstrations of worth upon which other sales are based.

In line with, and resulting from, this increased usefulness, the year 1928 witnessed a similar increase in the production of both aircraft and engines. When the Kelly air mail set was passed in February, 1925, there were 24 aircraft and engine manufacturers, having a total annual output valued at \$12,534,719. By the end of 1928, the number of manufacturers had increased to 59, with a total output for the year 1928 valued at \$24,341,752, an increase of more than 60 per cent over the previous four years.

THIS IT WAS that the Ford Motor Company, having developed its plant to a point where it was deemed advisable to go after the existing market, turned to do just so in that market being so open. At that time, however, the car was not in a position to meet up satisfactorily with the general public. Prior to October, 1926, when the new plant was completed and ready for the production of the reorganized craft, scarcely anything sold. Between January 1926 and Jan. 29, 1929, it is fact only four of the 4-17 series had been produced, making an average of one engine every three months.

With the transfer of operations to the new building, production has increased steadily from the four-a-shift schedule effective there to the four-a-week schedule in operation now. And as this is written, the company announces building plans for enlarging their plant by 155 per cent and making possible the production of one

In a previous instalment we mentioned the Ford Motor

Early in 1927 these experiments had reached a stage where public demonstrations could be carried out. In this work it should be understood, the Ford company did not stand alone. Since July, 1926, the Bureau of Standards of the United States Department of Commerce, had been working actively along this same line. Other participating organizations included the General Electric Company and the Union Socony Am. Gasoline Service.

The Bureau of Standards had established an experimental field at College Park, Md., in October, 1906, and in December has carried out some highly fruitful experiments, using a DH plane transferred from the Post Office Department. This work embraced both aerial photography and aerial surveys.

However, on Feb. 20, 1923, the Ford Motor Company accomplished the first long distance airplane flight on which the passengers guided solely by radio. On this flight a trans-Atlantic radio telephone equipment for the experiment was flown from Dearborn to McFarland Field at Dayton, Ohio, and back, gaining its bearings throughout the journey from radio stations transmitted from the Ford radio stations in Dearborn. Another and more interesting experiment along this line was carried out the following May.

On Feb 15 1927 the Ford mail lines had completed one full year of service, and during the week Postmaster Charles C. Kellogg, of Detroit, issued a report covering the operations for the year. The report showed that 96.6 per cent of the scheduled flights cover both the

Very truly bearing the name of the former Rev. Mr. Johnstone "High" at 44 (now), to which he made his home High Ave. 26, 1881.

Chicago and Cleveland routes had been completed. On the remaining 34 per cent 82 per cent was changed to weather conditions or lack of mail, and 12 per cent of flights began late, not completed due to weather conditions encountered enroute. Between Feb. 15, 1936 and Feb. 1, 1937 the Ford mail planes had flown a total of approximately 44,000 miles, and carried 2,725 lbs. of

In his report Postman Schlegel revealed something of Mr. Ford's willingness to cooperate with the government agencies in the furtherance of aviation. "To date much cannot be said in behalf of the attitude of the Ford Motor Company," the report read. "Quite a long time after this company's control was established, Mr. Ford directed that the newly organized corporation own and operate its own aircraft to carry the newly won transportation over the roads. This was done, but the corporation did not have sufficient data wherein to base its schedules and operations, and so made the necessary preliminary arrangements. We should not lose sight of the fact that was it not the Ford Motor Company in turn forcing interpretation for its own products, the air mail and these money-making

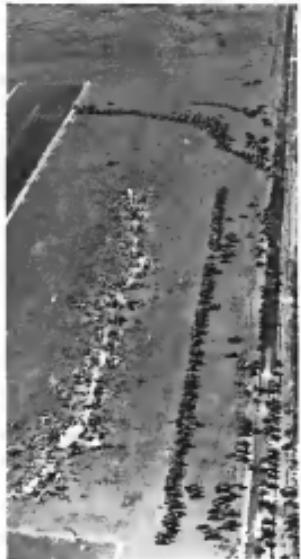
to be in early as less." The first flight of the Ford airship was inaugurated March 28, 1927, making the daily mileage of flying to 1,456 miles. The British and American mail was easy and since the Dornier-Heffelof had had less difficulty adapting as an air mail route. The following month saw completion of the company's second year of airship operation, a two-year period during which the company's planes had flown a total of 30,610,630 miles, transported 3,062,048 lbs of Ford freight and 3,085 lbs of United States mail. The company at this time had not yet used one of its early model single-engined 1200-hp. Ford aircraft in Army service. It had been four years

The month of May 1927, was featured by another demonstration of the company's experiments in the field of radio. In aviation the world over, that month is memorable for one of the greatest flights of all time—a flight which, had it been successful, would have won the \$25,000 prize offered by the Orteig Committee.

Unbiased History of World War World War

venture before or since. When Charles A. Lindbergh landed his Ryan monoplane on Le Bourget field on the 21st day of May, following his record-breaking journey across the sea, arrived as a honored guest in a worthy reception, and made a most substantial loan at the expense of the American investor, that is a different story, and one far too well known to repeat here.

From May 24 the All-American Airways Douglas was held in Washington. During the exhibition the Bureau of Standards demonstrated its directive radio beacon and radio telephone in a practical way, to and from airplanes at the Douglas. Following the Washington event, a tri-engined Ford monoplane, equipped with a radio compass, took off from Bolling Field on the return



The First Year of 1925 between Chicago

right to Detroit. There were eight men in the plane: William H. May, William H. Stott, Harry Lindbergh, the pilot Harry Russell, the engineer, two Bureau of Standards engineers, and one newspaperman. Constant telegraphic communication was maintained with those on the ground in Washington until the plane was approximately 100 miles away from the capital.

Bill Stott gives a most interesting account of this

flight. "We were about 30 miles out from Washington," says Mr. Stott, "and I was talking with someone in the window when I observed a small plane of some sort. I decided to have this checked with my old friend Bill MacCloskey, as I furnished the Bureau of Standards with his office telephone number and they put him on the line. Through a connection in the Bureau's office I was able to talk with him, and we both got a great kick out of it."

When the plane had departed from Washington it was decided to land at Buffalo, whose prospective place purchaser was waiting. As it happened, Bill Stott had a dental disease appointment in Detroit for 8 o'clock that night and the intended Buffalo delay warned him not a little. Some cogitation, and thanks to the plane's special equipment, he saw a way out. Ushering the radio telephone, he asked a Bureau of Standards official in Washington to wire Mrs. Stott that he would be late into Detroit, and would she please meet him at the airport with the car.

After that," Mr. Stott said, "I felt much easier. We landed at Buffalo, picked up a couple of passengers, flew up to the Falls, and then down to Buffalo, and then took off for Detroit. A short while before we were due to land I opened up my suitcase, and changed into our dinner clothes. My wife had received the wire and met me when our plane landed. I got to the dinner in good time."

Radio was used in connection with the company's planes on two notable occasions after that flight. The first was in June, when the Bureau of Standards equipped a Ford plane, from which the reception accorded Colonel Lindbergh when he returned to America aboard the cruiser "Memphis" was broadcast. The other was during the third annual Ford reliability tour that summer. The company's entry in the race was equipped with a transmitter and receiver having a range of 300 miles, as well as a radio compass. With the exception of 355 miles between Dallas, Tex., and Wichita, Kan., the tour was conducted entirely without Douglas during the entire tour.

Again from the Lindbergh flight and its magic effects the spring and summer of 1925 will be remembered for another great progressive step in American aviation. Following seven years of development in an incubator, so to speak, the government was ready to relinquish its last hold on the nation's air mail system. On July 1, the Boeing company, successor-filers for the 1,895-mile stretch between Chicago and San Francisco, began operation of that portion of the transcontinental route. The Chicago-New York section, 712 miles in length, was awarded to National Air Transport, Inc., and formally turned over to them for operation on Aug. 15.

Until this time, despite his tremendous achievement in aviation and despite his repeatedly expressed faith in the airplane as a commerce carrier, Henry Ford himself had never flown. But, on Aug. 10, 1927, Colonel Lindbergh went to Detroit and took Mr. Ford for a ride. The flight was made in the "Spirit of St. Louis" and the flightless passenger sat on an improvised seat a few feet above, during his first journey in the air.

Following this, Mr. Ford made a second flight, this time in one of his own planes with Colonel Lindbergh as his guest.

The eighth and last article of this series by Mr. Nevill will appear in an early issue of AVIATION.

A. S. M. E. Seaplane Meeting AT CLEVELAND

*Rohrbach, Richardson, Sikorsky and Others
Speak on Marine Flying*

By EDWARD P. WARNER



Dr. ADOLF ROHRBACH

ONE OF THE CLOSING EVENTS of the Rate Week was the informal program arranged by the American Society of Mechanical Engineers and held in the Austin hangar at the airport on the morning of August 31. Seven papers had been scheduled for the meeting, over which the Hon. David S. Ingalls, Assistant Secretary of the Navy for Aeronautics, presided, but owing to lack of time and the absence of some of the authors only four were actually delivered.

Senior Jean de la Cuny presented a paper on the autogiro studies to which he had devoted his time as a student in the September 7 issue of AVIATION. Interested in the subject had he the numerous books published by Senior Jean de la Cuny's several demonstrations of his own machine in flight at the airport, display in the course of which he had put the champions of the airships dead-stock racing contests to shame by dropping the aeronauts vertically directly on top of the spot and in a target in the accuracy competition.

Of the mere formal papers for which manuscripts had been prepared the longest was jointly written by T. P. Wright, chief engineer of the Curtis Company, and G. A. Loring, his assistant. It was a general compilation of the uses of seaplanes and the conditions governing their design and construction.

Like others who had made a special study of the subject, Mr. Wright and Mr. Loring held great interest upon the many advantages offered by the utilization of seaplane landing fields as the water connection of a city's waterfront to its business center. Other points of advantage for the seaplane, less often stressed, were also pointed out. Among these were the availability of lighthouses and other aids to navigation, already existing all along our coast lines and important means for the benefit of water craft and equally serviceable for navigation by air. The primary importance of safety in air transport was taken by the authors as a fundamental truth.

The body of the paper was largely designed to inform readers of limited experience in aeronautical engineering, and contained little that was new in its treatment of the

subject. The subject of maneuverability on the water was given more attention than it sometimes receives, and the authors spoke briefly of the use of a water rudder to aid in securing it. In describing their idea of a hull for a seaplane they suggested that the ship should be placed from 13 to 2½ feet astern of the center of gravity of the plane and that the tail of the boat should be very hollow, or much flared, over the bow so that the plan form of the hull at the center of the bow will be flat in the bow. "Ideal American aircraft in flight will have very conical form to this ratio, but some of the most successful German flying boats have had very flat bows forward."

A point in design often overlooked, but which received much attention from Mr. Wright, is the form of the stern and its effect upon the longitudinal stability and take-off qualities of a hull. The paper stressed the necessity of cautions with a short hull, and tall surfaces cleaned up forward, but the machine should capture headwinds when drifting in a head wind.

Mr. Wright and Mr. Loring suggested that they saw possibilities in the use of hydrofoils or separate planing surfaces below the hull of a seaplane. They suggested the practical difficulties, but urged further research upon the subject.

For the design of a flat-supporting structure they recommended that a long factor of 8 be assumed in loading. The mean distribution of pressure on a flat bottom when raising a flat-bottomed boat was reflected by form made by the N.A.C.A. for the Navy. As the paper pointed out the maximum loads were found just forward of the step and reached 7½ per cent.

Summarizing construction practice attention was called to the advantages of the composite type with wooden frames and a metal skin, especially in small airplanes where it proves, as the authors declared, to have a very decided advantage in cost over the completely metal-framed structure.

DR. ADOLF ROHRBACH, famous builder of flying boats, created the problem of design from a point of view somewhat different than that taken by Mr. Wright and his collaborator and went into many technical detail

He laid particular stress on the necessity of using very high wing loadings if large airplanes are to be built without loss of structural efficiency and economy of operation. If this is to be taken as a fundamental necessity, he pointed out that the flying boat has an advantage over the biplane in very large wings, as they are strong and can be built with a much lower wing loading than is possible for biplanes which cannot come in airways of limited dimensions. Dr. Rohrbach concluded that the size of a flying boat of maximum commercial economy was in the neighborhood of 20 to 25 tons gross weight, while the last commercial biplane would carry only half



Mr. Wright (left) and Mr. Rohrbach, present speakers on the use of monoplanes and biplanes.

of that total load. The large flying boat has a further advantage in improved maneuverability. The author made no statement, however, that the present limits of efficiency were permanent, and he felt there would be a continuation of the upward tendency.

Dr. Rohrbach gave the preference to the monoplane for flying boat service, both on aerodynamic and on structural grounds. He recommended tapered wings as being more advantageous in flying boats than in land planes, since they reduce the rolling motion in the water in side winds and make the boat easier to handle than it would be with wings of rectangular form. He touched upon a point which caused much discussion in America a few years ago, but has had little attention recently in recommending the use of aileron surfaces with very little center of pressure travel, and therefore very little movement of the center of pressure, even at some sacrifice of efficiency. Both the torque in the wing and the loads on the tail structure can be reduced by the use of such a system, at the cost of the tail surfaces.

Dr. Rohrbach emphasized the importance of consistency in a studied attitude as an adjunct to maneuverability. Unless the machine was stable and under full control in taking off and landing under bad conditions, a large disadvantage. He recommended using a dihedral of four to 8 deg which is, however, considerably larger than American practice generally provides. The large dihedral being conducive to good pitch stability and maneuverability, apparently a correct bank without the use of the ailerons, the paper reported that it had been found possible to turn the Bessier with angles of bank up to 20 deg with the use of the rudder alone and the ailerons neutral.

In commenting on the conditions for the design of the

detention system, the author said that it was his practice to design the machine, ride faults to give enough reserve of lateral stability for the machine to withstand a side wind of 30 mph, without the need of a rudder. He also recommended that the design data were given plane characteristics of their own to help the machine up to the surface, as the machine can help the natural planing speed of the control levers. The struts with large auxiliary floats due to the hull had been found very unsatisfactory, and had been several years and a great amount of alone.

For bottom floats, the hull built by Dr. Rohrbach and described in the paper have a pronounced curved V forward of the stem, and a straight V astern. Two distinct steps are used. The design has been the result of extensive flying boat tests on models, several hundred models having been built and tried in a total of more than 2,000 runs. This general method of test is, of course, similar to that used in developing the hulls of U. S. Navy boats at the Washington Navy Yard. That tank having been built for other purposes and hence quite limited in capacity, the author said that a complete set of dimensions for these boats will be available when the new laboratory of the National Advisory Committee for Aeronautics is completed at Langley Field. It is understood that the plan is for it to be a site and operating speed beyond anything so far attempted elsewhere.

The form of hull developed in Dr. Rohrbach's tests and used by him on some differs notably from the practice of most other designers, especially in the small bows and high drift and freeboard. In the planing attitude, according to Dr. Rohrbach's paper, the Bessier rises about four feet higher than when floating at rest, thus increasing the wing and propeller clearance in a rough sea and take-offs and landings had been made in waves running twelve to fifteen feet high.

Testing up questions of material and structure, special emphasis was laid on the importance of a strong structure and the necessity of using minimum elements of equipment, through suspension at one point. For the use of a monoplane, however, Dr. Rohrbach recommended water-tightness and the exclusion of the corrodin agent as the best protection against deterioration. An example is found in the duralumin wings of these boats, which are made in the form of water-tight tubes held together. It was pointed out, too, that the housing thus secured was a safety factor in case of serious damage to the hull.

THE THIRD PAPER upon the general subject of design was prepared by Captain H. C. Richardson, vice-president in charge of engineering of the Great Lakes Aircraft Corporation. Captain Richardson's paper was not actually read at the meeting. It covered some of the same ground as given by Mr. Wright and his associate, and will be given more detail upon that form and its effect on present qualities. Captain Richardson especially concerned float designs against the action on the bottom if the hull has no much of a "nose." Item 1 is too much curved forward of the step in profile. This is especially objectionable on surfaces with a small reserve of power, as it may prevent getting past the "hump" ahead and up into the step. He discussed the necessity of guarding against the use of fast surfaces creating wave lenses which would interfere with each other where they met aft of the float and might be troublesome to the tail surfaces of the machine.

The surface was outlined to measure a straight V

bottom in preference to a hollow V, notwithstanding the present tendency toward the latter. He found the hollow V likely to pound in rough water and likely to create bad wave formations. Captain Richardson recommended 20 degrees of V as a little more.

Referring to construction, he called attention to the increasing use of castings as fittings, main-passes, etc., in metal boats. He recommended the use of a single piece of metal for securing the bottom side of a float, as well as top, to the stem, and closed by pointing out that the practices of the past are not the best and that construction becomes increasingly applicable to float and hull constituents as the use of the structures increased and as the problems required more detailed study and more refined solutions.

LOW STATIONARY, as might have been anticipated spoke on more specialized float designs, particularly to the amphibious type which has claimed most of his professional interest for the last few years. Giving the credit to Grover Lowdag for having developed the first practical amphibious airplane, Mr. Siskorsky went on to discuss especially the practical advantages of an amphibious gear for commercial and private use. He added, however, certain specific figures pertaining to technical points upon which information had not been generally available. In his own aircraft, for example, Mr. Siskorsky reported, the weight of the landing gear is 25 per cent of the gross, and involves a subtraction of 24 per cent from the hull. The parasitic drag of the elements added by landing on the ground is about 9 per cent of the total parasite for the plane. The author frankly admitted these handicaps and also certain spatial problems of design peculiar to the type, such as the necessity of making the brake mechanism water-tight, or otherwise protecting it from damage due to freezing as a result of mixing with the wheel oil when submerged. He pointed out also that the design of a tail skid which will not interfere with water performance was a particularly troublesome matter.

Turning to the economic side, Mr. Siskorsky, while comparing with Mr. Wright about the advantages of having landing fields for marine airplanes available close to the heart of most great cities, found another important benefit in the increased safety in flying boats. Within fifteen miles of the air base between New York and Washington, for example, he had determined that the total number of suitable landing-fields, as marked on airway maps, was only 7.35 square miles, or, again, 250 square miles of available inland water.

Another special advantage foreseen for the amphibious was its use in connection with seaports or artificial islands for transoceanic air traffic. Another was the use of services such as in some of Latin America where land fields and water fields have to be used in alternate turns because of the terrible mapping photos have inadequate harbors, while others have no proper airports.

The transition from Mr. Siskorsky's paper to that of James T. Tripp, president of Pan American Airways, Inc., was logical, as Mr. Tripp's company takes much use of amphibians, and Mr. Tripp's paper (not actually read because of lack of time) was a summary of the author's interest in the advantages and disadvantages of amphibians. The author said, in fact, that about one-third of all of Pan American's flying to this date has been with amphibious types.

Recognizing the advantages of flexibility of the amphibian, previously referred to in releasing Mr.

Siskorsky's paper, Mr. Tripp was nevertheless concerned over the increased weight and decreased performance of the type as compared with the straight seaplane. Like Mr. Wright, he saw a distinct advantage in the decreased maneuverability which passengers might experience when flying over water, while landing at say base would be possible. Another advantage, especially for backward flying, was the fact that the time required for takeoff and landing was considerably less.

Mr. Tripp pointed out, however, that it was a mistake to think of the seaplane as requiring an airway or special provision of its own. He, too, feels organized bases and specially trained personnel. Proper training, safety, and fueling facilities for seaplanes are still rare in the United States. Mr. Tripp pointed out that non-passenger operating aircraft had to provide them at their own expense. One measure which, in his opinion, would greatly facilitate operation of terminals would be the provision of retractable landing gear for testing purposes only so that flying boats might be driven into and out of the water under their own power without delay for attaching a wheel gear or putting them on a landing track. Mr. Tripp suggested particularly for airline manufacturers to give special and detailed study to the problem of the commercial flying boat.

THE ELEVENTH PAPER, also presented at the meeting by this title only, dealt with the cataloging of aircraft from commercial vessels and came from Lieutenant W. D. Feltz, U. S. N. L. Lieutenant Feltz outlined the numbered problem of catapult design and operation, and the Navy's experience in catapult operation. He called particular attention to the magnitude of the forces involved, the acceleration of the airplane starting up to three times gravity during the launching, and the car then being checked with a negative acceleration of 100 times gravity. He laid special stress on the importance of a suitable routine of operations, and of simplified mechanisms, pointing out that the first catapults were very complex in design, while the latest mechanism has now been simplified to the point where it is only necessary to throw a single lever to make the launching.

Returning to the commercial aspects, the author argued the importance of landing fields, such as those already mentioned by the French Line and the North German Lloyd on the Bremen. He gave as an example his preferred case—a take-off 200 miles at sea, which would take from five to seven hours in delivery and in New York, and furnish still larger benefits for deliveries in Paris and London.

Lieutenant Feltz found no difficulty in increasing the use of catapults and in making them take care of passenger planes. He suggested, however, that the airplanes could probably be reduced when that was done, by the use of either a lower rate-of-speed of a longer run along the catapult track. From his extended experience he urged in connection that commercial operation with catapults should be undertaken with great care, and working out the special problems one by one. "Increase of range and load," he said, "should be made by small increments." As an all too frequent result, the author said, Pan American's flying to this date has been with high-speed, single-engine, high-wing craft to offset the cost of operation, which will be high, even after every unnecessary expense has been eliminated. The physical problem of disengaging an airplane from the deck of a ship has been solved."

GENERAL NEWS

England Wins Schneider Cup
With Speed of 328.64 M.P.H.Supermarines Take
Race and Make Records

ENGLAND (UPI)—England was taken in the grand premiere of the Schneider Trophy race, which was delivered by the British aircraft who took away everything else in the aeronautical world. It is the second British victory in as many Schneider races since 1927 and can be added against the Italian last year.

Flying Officer Henry R. D. Waghorn was the winner Saturday, Sept. 7, in the race over 100 miles of the coast of Italy. It is an average speed of 328.64 m.p.h. He piloted a Supermarine Spitfire, Series 2, a derivative of the Supermarine Nighthawk used in two trans-Atlantic and which finished fourth in the 1928 race. The British Avro 504K, a biplane, was second, and the Italian Macchi 202, a derivative of the Macchi, third of the power planes.

It he was fastest in land when a sister plane, the Supermarine Cuckoo, was the slowest. The Italian, however, was the best at 284 m.p.h., while he was fastest in land by engine trouble and an accident was involved.

The biplane, which was considered the best, was piloted by all six machines in the three record runs. In the first 400 m.p.h. race, the team was 24.00 m.p.h. faster than the Italian. The Italian Major De Bernardi was the 1928 winner at Macchi's Roads.

Another Six Win Records

Waghorn shared this year's honors with Joe Rutherford, Flying Officer R. L. R. Anthony, who established two new records for the 300 m.p.h. and 400 m.p.h. race, and with the Italian 310.66 m.p.h. land average speeds of 302.48 and 328.64 m.p.h., respectively. He used another Supermarine 202. These are the fastest officially certified speeds ever recorded. The Italian group, however, was beaten made by the British and English teams to better records—302.

Anthony was disqualified for failing to turn out at the pilot's controls, so was given a place in the Schneider Trophy race. He, however, piloted a Macchi Fiat 322 over the course at the average speed of 284.20 m.p.h. That plane was won by Flying Officer James G. Gray, who was clocked at 282.11 m.p.h. The Italian team, consisting of Guglielmo Negri, who was the fastest and George's Supermarine 202 had been beaten in the 1928 race.

Last October, Negri, flying one of the new Macchi Fiat 302, record breakers, claimed the first Sep. 10 at 308.47 m.p.h.

Chinese Government
May Buy Planes Here

PHILADELPHIA (UPI)—A delegation of Chinese Government, which is to be presented to the State Department provided that the Chinese Government has been given a loan, demand to go to the Nationalist Government. It is reported that all Nationalists are in the market for 300,000,000 dollars of planes, but this could not be confirmed by the American delegation. It was stated that to do so an order was placed through that office and that the delegation has not received any advances from China concerning the purchase of aircraft. The Chinese are not an experienced people. A cable to the Department of Commerce from Shanghai states that American manufacturers are participating in the attempt to get the Chinese to buy.

The air mail route under which the

world powers agreed to all nations

concerned to China, was filed, last

spring, but when the threat of hostilities

arose, the State Department would

not permit Chinese commissioners to go

to China to buy planes.

The Department has decided that American manufacturers and ship planes, an im-

portant part of the business, is expected

France and the United States. France withdrew following the death of a racing pilot in training and the plane was not used. The United States was eliminated by failure of eight runs of Louis Alphonse J. Williams' Mercury racer. The English Gloster-Nighthawk 6 was not used.

The Cuckoo and the Cuckoo II were

disqualified for engine trouble.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however, did not

try to get away from the race.

The English team, however

Announce Traffic Meeting Program

Airline Officials Confer At Kansas City Sept. 10-18

KANSAS CITY (con.)—Development of increased mail and passenger traffic over air transport lines will be the principal subject considered at the National Air Traffic Conference of the Airports Council International, to be held here Sept. 10-18. The conference will be called by Frederick B. Rentschler, president of the Chamber of Commerce. The conference will be the object of seeking greater co-operation in the efforts of the various transport companies.

The three-day conference will open with a luncheon meeting of the Kansas City Chamber of Commerce, followed by a dinner meeting of the National Air Transport Association, and the conference will be closed by Charles L. Lammert, Col. Robert Diamandis, Director of Air Transport, who will also speak at the luncheon.

Committee to Study Postage

Col. Harry H. Rice, of the Department of Commerce, will open the afternoon session with a talk on "Air Transportation, Its Importance, Development and Present Status." James G. Wadsworth, president of the National Air Mail and Express Association, will address the conference on "Traffic to the Foundation of Air Transport." T. B. Clinton, T.A.T., will review the problems which confront the transport companies in their efforts to increase revenues to match them. Charles L. Lammert, in a special committee to study the second day's session, will report on the third day.

Edgar H. Holloman, S.A.P.E., will open the morning session of the Sept. 17 conference with a talk on "Rate Making and Operations Control." Major John P. O'Kane, Commercial Air Transport Association, will speak which will be devoted to a discussion of efficient methods to sell air traffic.

St. Louis Sales Program

Short talks on sales programs developed by the major transport lines will be delivered by W. E. Whiston, Western Airlines; L. E. L. Johnson, Pan American Airways; Inc.; C. C. Cole, Western Air Express; Herbert Horner, Jr., Western Air Express; and Frank J. Clegg, Pan American Airways, Inc., chairman.

Ralph S. Western, Western Airlines, Inc.; Charles E. Clegg, James Clegg Flying Service; Samson Smith, Colgan Air Transport, Inc.; and W. A. Patterson, T.A.T., Thomas D. Jr., Western Air Express; W. A. Patterson, Boeing System; Walter F. Vary, Varsity Air Lines; W. A. Linton, United States Airways; and W. A. Patterson, Western Air Express, St. Louis and W. A. Patterson, N.A.T., at a

luncheon session designed to study the status of mail and passengers on air transport lines will be the principal subject considered at the National Air Traffic Conference of the Airports Council International, to be held here Sept. 10-18. The conference will be called by Frederick B. Rentschler, president of the Chamber of Commerce, and Col. Robert Diamandis, Director of Air Transport, who will speak at the object of seeking greater co-operation in the efforts of the various transport companies.

The three-day conference will open with a luncheon meeting of the Kansas City Chamber of Commerce, followed by a dinner meeting of the National Air Transport Association, and the conference will be closed by Charles L. Lammert, Col. Robert Diamandis, Director of Air Transport, who will also speak at the luncheon.

Imperial Plans International Race

FORGOTTEN (con.)—Indefinite announcement is made by C. C. O'Sullivan, president of the Imperial Air Transport Company, that his firm is contemplating a contribution of \$50,000 for the purpose of promoting an international race event to be called the "Imperial Air Race." It is anticipated that this race will be locally known as next meet and that it starts at some important United States and ends at a Canadian racing track. The proposed race would be open to all to attract passenger flights from as well as to the United States.

express traffic, will be in session at the same time.

Ralph H. Higgins, N.A.P.E., will be the speaker on the express mail and passengers which will be preceded by C. C. Cole, Western Air Express; Herbert Horner, Jr., Western Air Express; and Frank J. Clegg, Pan American Airways, Inc., which Frank Horner, Boeing Air Transport, will be the speaker. Passengers and advertisements and its relation to increased traffic will be discussed by Edgar H. Holloman, S.A.P.E., and W. A. Patterson, T.A.T., Thomas D. Jr., Western Air Express; W. A. Patterson, Boeing System; Walter F. Vary, Varsity Air Lines; W. A. Linton, United States Airways; and W. A. Patterson, Western Air Express, St. Louis and W. A. Patterson, N.A.T., at a

luncheon session designed to study the status of mail and passengers on air transport lines will be the principal subject considered at the National Air Traffic Conference of the Airports Council International, to be held here Sept. 10-18 at the Boston Garden, to be discussed by Lester D. Sorenson, of N.A.T., at a

AVIATION

September 14, 1939

special session on express mail which will be presided over by H. W. McElroy, of Universal Air Lines. E. W. Ireland, N.A.T., will discuss the problems connected with the development of air mail traffic and Samson Smith will speak on the problems of the present mail service and the various methods of developing air mail express traffic.

A luncheon will be attended by all the delegates, and Paul H. Hirschman, S.A.P.E., at other Col. Fred Holloman, president of the Chamber of Commerce, will be the toastmaster. Speakers will be Edward S. Ross, Darien Aviators Corporation; William P. MacCormac, Joe and Samson Smith, and W. A. Patterson, T.A.T. The conference will make arrangements at a special luncheon Wednesday evening with C. W. H. Smith, Western Air Express, as chairman. This will be further discussed in a final afternoon session to be presided over by Stanley E. Knutson, St. Louis.

Nine Papers Exchange News Via Airline Service

LOS ANGELES (con.)—An aerial newspaper service has been established by the Los Angeles Times in conjunction with the Los Angeles Times, of the city. By the news service, the papers exchange early editions over the airways and expand in a special manner to include the latest news items from the various papers with which the changes is effected. This makes it possible to publish certain news items which are not considered important enough to go on the front page of the newspaper, but which can be printed while the front is still fresh by means of the airplane service.

Papers continuing in the new news service are The Los Angeles Times, the Salt Lake Tribune, Washington Evening Star, Indianapolis News, Kansas City Times, Kansas City Star, The Arkansas, Memphis, Chicago Tribune, and Minneapolis Journal.

Mid-Continent Gets Folklore

LOS ANGELES (con.)—Three Folklore flights, each of an expected order of seven, recently have been offered in the Mid-Continent Air Express by the Air Express Corporation of California, the distributor for Folklore air mail. The first Folklore flight was made on the Mid-Continent Air Express, Los Angeles to El Paso, Tex., Denver, Colo. and Kansas City, Mo., which is expected to be put into operation within the next few weeks.

Imperial Summarizes Sales \$302,078

DETROIT (con.)—Ely Rhiney of Dodge Air Corp. and \$302,078 worth of planes, engines and other equipment in the period from June 1 to Aug. 26, is announced by Edward S. Ross, president. This total includes \$7,000 worth and specially equipped planes as well as other aircraft and engines.

AVIATION

September 14, 1939

Company Will Use Blimp Commercially

NEW BEDFORD (con.)—A proposal is to be incorporated shortly as "New England Airship Company" which has connected with the Good Year-Zepplin Corporation, and the two will be in complete control of the "Mastodon," now operating at the Round Hill Airport, South Dartmouth. Announcement was made by Arthur G. Holloman, head of the system with which the blimp is connected, and Thomas J. Andrews, president Andover & Perry Trichlor Company, New Bedford. Col. Paul H. Hirschman, N.A.T., executive director of Chamber of Commerce, and Frank J. Clegg, Pan American Airways, Joseph F. Mullin, general Fall River, Harry R. Sherman, formerly, Darmstadt, Germany, S. L. Lammert, and Winston King, Darmstadt, who are the principal stockholders in the blimp which will be used for the Southerner, Darmstadt, and Fall River.

The dirigible, to be used commercially, will be the first sold by Goodyear-Zepplin Company, to private interests, will be given New England the greater part of service of the United States. The dirigible will be available May 1, 1940.

To Offer Barling With Genet and Velié

MARSHALL (con.)—Barling N.B.3B monoplane equipped with either Genet or Velié power will be available shortly in addition to the stock model equipped with the Le Bourget 60% as has been announced by Col. Fred Holloman, president of the Chamber of Commerce, and Frank J. Clegg, Pan American Airways, Inc., chairman of the plan's monoplane committee of the plan's committee. Specifications and performance figures have not been announced, but it is said that the Genet-powered Barling will have a range of 1,000 miles.

Production of the model is to begin shortly. A new feature is a standard major mount which accommodates all three engines. Several other features have been announced, but it is said that the design will be changed as necessary to insure thorough a fighter as well as a transport.

The Barling Model is a four passenger full cantilever type flying boat. Production models will probably be powered with 260 hp. Hispano-Suiza cylinder engines, and will have a passenger capacity of 10. The body of the monoplane will be covered with duralumin, and will contain two separate water-tight compartments. Metal Aircraft Corporation, the only manufacturer

Hester Box Becomes Air-minded

CHICAGO (con.)—Possible establishment of an airtanker station on the old Indianapolis race way South Michigan Avenue is indicated by the leasing of a 100-acre tract by the Hester Box Company, Chicago, to the Indianapolis Air Service Corporation.

At the Indianapolis Air Service, Inc., the second building in this district leased to aviation enterprises within the same city by the same agent. The third building will be used as a flying school and terminal.

Third Overheads Ordered

OMAHA (con.)—A single order for 21 places and another for five has been received by Greatland Airways, Inc. this city. A. L. Best, Hagerstown, W. Va., placed the large order

D.A.C. Buys Long Beach Site

LONG BEACH (con.)—Detroit Aircraft Corporation, announced it had purchased a 100-acre tract located at the mineral springs area, to be ready by September, with the intent of locating there all the aircraft and Lockheed aircraft plants. The D.A.C. division eventually will locate. The Lockheed plant is now located at Burbank, Calif.

Arrow Firm Orders 100 Fairchild Geants

NEW YORK (con.)—That a contract has been signed by Arrow Aircraft & Motor Corporation, Hollywood, Calif. for 100 Fairchild Geant aircraft is announced by A. G. Holloman, Fairchild Aircraft Manufacturing Corporation, president. The order is for \$1,000,000 for the first 40, 80 hp, six cylinder radial engines in sight at once. The plan is to start building the first 100 in October.

An order for 100 Grant aircraft also has been placed by the Nicholas-Haynes Airplane Company, Marshall, Mich., for use in Barling N.B.3 planes. The 100 aircraft will be powered by 260 hp Hispano-Suiza engines. The first 20 will be delivered in October. The second 20 in November. The third 20 in December. The fourth 20 in January. The fifth 20 in February. The sixth 20 in March. The seventh 20 in April. The eighth 20 in May. The ninth 20 in June. The tenth 20 in July. The eleventh 20 in August. The twelfth 20 in September. The thirteenth 20 in October. The fourteenth 20 in November. The fifteenth 20 in December. The sixteenth 20 in January. The seventeenth 20 in February. The eighteenth 20 in March. The nineteenth 20 in April. The twentieth 20 in May. The twenty-first 20 in June. The twenty-second 20 in July. The twenty-third 20 in August. The twenty-fourth 20 in September. The twenty-fifth 20 in October. The twenty-sixth 20 in November. The twenty-seventh 20 in December. The twenty-eighth 20 in January. The twenty-ninth 20 in February. The thirty-first 20 in March. The thirty-second 20 in April. The thirty-third 20 in May. The thirty-fourth 20 in June. The thirty-fifth 20 in July. The thirty-sixth 20 in August. The thirty-seventh 20 in September. The thirty-eighth 20 in October. The thirty-ninth 20 in November. The forty-first 20 in December. The forty-second 20 in January. The forty-third 20 in February. The forty-fourth 20 in March. The forty-fifth 20 in April. The forty-sixth 20 in May. The forty-seventh 20 in June. The forty-eighth 20 in July. The forty-ninth 20 in August. The fifty-first 20 in September. The fifty-second 20 in October. The fifty-third 20 in November. The fifty-fourth 20 in December. The fifty-fifth 20 in January. The fifty-sixth 20 in February. The fifty-seventh 20 in March. The fifty-eighth 20 in April. The fifty-ninth 20 in May. The sixty-first 20 in June. The sixty-second 20 in July. The sixty-third 20 in August. The sixty-fourth 20 in September. The sixty-fifth 20 in October. The sixty-sixth 20 in November. The sixty-seventh 20 in December. The sixty-eighth 20 in January. The sixty-ninth 20 in February. The seventy-first 20 in March. The seventy-second 20 in April. The seventy-third 20 in May. The seventy-fourth 20 in June. The seventy-fifth 20 in July. The seventy-sixth 20 in August. The seventy-seventh 20 in September. The seventy-eighth 20 in October. The seventy-ninth 20 in November. The eighty-first 20 in December. The eighty-second 20 in January. The eighty-third 20 in February. The eighty-fourth 20 in March. The eighty-fifth 20 in April. The eighty-sixth 20 in May. The eighty-seventh 20 in June. The eighty-eighth 20 in July. The eighty-ninth 20 in August. The ninety-first 20 in September. The ninety-second 20 in October. The ninety-third 20 in November. The ninety-fourth 20 in December. The ninety-fifth 20 in January. The ninety-sixth 20 in February. The ninety-seventh 20 in March. The ninety-eighth 20 in April. The ninety-ninth 20 in May. The one-hundredth 20 in June.

Miami Maid Airplane To Be Given State Tests

MIAKELAH (con.)—In order to assure himself that his Miami Maid is alone Department of Commerce registered, L. C. McCarr, Jr., director of Miami Maid, is supervising the entire design department of the plant. The type certificate of the Miami Maid is not yet issued. Officials of the company say that the design will be changed as necessary to insure thorough a fighter as well as a transport.

The Miami Maid is a four passenger full cantilever type flying boat. Production models will probably be powered with 260 hp Hispano-Suiza cylinder engines, and will have a passenger capacity of 10. The body of the monoplane will be covered with duralumin, and will contain two separate water-tight compartments. Metal Aircraft Corporation, the only manufacturer

of the Miami Maid, is located at the Miami Maid Service station at Miami, Fla., and is the only manufacturer of the Miami Maid.

At the Miami Maid Service station, the Miami Maid will be used as a flying school and terminal.

Establish Southern Air Service Stations

NEW ORLEANS (con.)—Service for passengers and cargo, 100 aircraft aircraft, will be established throughout the South by Southern Air Transport Service. Six divisional stations are already in operation, and the company's plan is to have one available for Travel Air, Cessna, Cessna Relier, Cessna 140, and Tri-motor planes, as well as for ingests.

At present, the company intends to establish a service station at each division point on Southern Air Transport Service's network. The new stations will be located in Birmingham, Ala., Mobile, Fla., Pensacola, Fla., and New Orleans, La. The new stations will be open to all passengers, including employees, writers to obtain plane passes, and to have aircraft repaired. The hubs of the new stations will be covered with duralumin, and will contain two separate water-tight compartments. Metal Aircraft Corporation, the only manufacturer

Braley School Opens New Student Dormitory

WICHITA, Kans.—More than 6,000 persons visited the new dormitory of the Braley School of Flying, during the first week of its opening, which was opened here recently. The new plant, located at the mineral springs area, is the second of 11 to be placed in operation. Seven new students from 10 states and all the Canadian provinces, as well as from 10 foreign countries, are now residing there, representing nearly every state in the United States as well as the Hawaiian and Philippine Islands, Canada and Mexico.

The new dormitory, which is 200 feet long and 30 feet wide, accommodates 160 students. It is fireproof and has a stone loggia with limestone columns. An administration building with class rooms and lounge space has also been completed. In order to handle the present expansion, the school is offering \$250,000 in stock.

J. V. Gregory is general manager. G. P. H. Hirschman, sales manager, and the architect is J. E. Bridges. Harold Weese, T. G. Stone, Fred Smith, A. G. Schlegel, F. H. Johnson, S. B. Richardson, Wayne Reddish, C. C. Wilson, John MacClure and W. J. Heath.

Establish Southern Air Service Stations

NEW ORLEANS (con.)—Service for passengers and cargo, 100 aircraft aircraft, will be established throughout the South by Southern Air Transport Service. Six divisional stations are already in operation, and the company's plan is to have one available for Travel Air, Cessna, Cessna Relier, Cessna 140, and Tri-motor planes, as well as for ingests.

At present, the company intends to establish a service station at each division point on Southern Air Transport Service's network. The new stations will be located in Birmingham, Ala., Mobile, Fla., Pensacola, Fla., and New Orleans, La. The new stations will be open to all passengers, including employees, writers to obtain plane passes, and to have aircraft repaired. The hubs of the new stations will be covered with duralumin, and will contain two separate water-tight compartments. Metal Aircraft Corporation, the only manufacturer

Domestic Reports Imports

OTTAWA, Can.—According to records of the Department of Customs and Excise, more 76 aircraft, valued at \$379,328 were imported into the country during the first quarter of the fiscal year. At the end of the quarter, the total value of aircraft and aircraft parts imported into Canada numbered 2,144. Passengers entering the country numbered 182, while those leaving the Dominion numbered 165.

■■■ PERSONNEL ■■■

Albert W. Koenig has been elected general manager of the United Carr Paper Company, Boston, Mass.

E. B. Scott, recently of the Pitcairn Airlines, Inc., offices at Brooklyn, N. Y., is being transferred to Philadelphia, Pa., as manager of the Pitcairn-Cessna Company and general manager of the Pitcairn-Cessna Company.

William E. Tolson has been appointed manager of the Cleveland Institute of Aviation, Inc., at the Cleveland-Glenwood Airport.

D. R. Johnson, formerly assistant manager of the Marshall Flying School, Marshall, Mo., has been appointed sales and advertising manager of the school.

James R. Lovell has been named publicity director for Arrow Aircraft & Motors Company, Louisville, Ky.

Frank C. Clegg, formerly of the U. S. Air Service, has been appointed general manager of the Detroit Aircraft Corporation, the Detroit division of the Detroit Aircraft Corporation.

Stan R. W. Schumacher, general manager of Omega Carriers Company, has been appointed manager of the Detroit aircraft division. Club recently organized an Change.

Sam S. Rice has been elected president of the Farnsworth Aviation Corporation to succeed S. M. Farnsworth, who has been chairman of the flying school of the Curtis Service and is also vice president of The Aviation Corporation.

E. T. McElroy will be in charge of aircraft equipment and accessory sales for the Curtis Flying Service at Port Huron.

R. S. Beville, formerly of the flight test department of the U. S. Army Air Corps at McCook Field, Dayton, Ohio, has been named chief inspector of the Spartan Aircraft Company, Toledo, Ohio.

O. R. Madigan, previous sales manager of the Alcotar Aircraft Company, Columbus, Ohio, has been made vice-president of the Von Hirschmann Aircraft Company to succeed the late George L. Lander.

J. K. Kavner, of Kansas City, Mo., will be in charge of the American Registration, Inc., operating between Shanghai and Harbin.

James Ritter is field manager and chief pilot of the recently formed Southwings Flying Corporation, Chattanooga, Tenn.

George P. Hartman, Jr., manager pilot formerly associated with Barber & Holloman, Inc., has been named software engineer for the Consolidated Instrument Company of America, Inc.

E. E. Bowers, formerly associated with the Shearson School of Aviation and the Lesser Aircraft Corporation, has joined the Rosta factory engineering staff of the Detroit Aircraft Corporation.

James Wren has been appointed vice-president of the Detroit Aircraft Corporation. Mr. Wren between 1932 and 1935 was chief engineer of the Naval

Air Station at Lakehurst, N. J., and was associated general manager of the Naval Aircraft Factory.

Lorraine G. Kinn, magazine and newspaper feature writer, has been made assistant to the president.

L. C. Ritter has been appointed assistant sales manager of the Pitcairn-Cessna Corporation of Cleveland. C. E. Scott will be in charge of aircraft sales and George J. Fischer has transferred from the engineering department to advertising and sales promotion.

Norman G. Sorenson, formerly of the Nichols Brothers Flying School at Marion, Mo., has been named business manager of the Pitcairn School of Aviation at Tulsa. Capt. A. K. S. will direct the flying activities of the school.

E. R. May has been elected president of the Palisades Air Club of Palisades, N. J., has been named business manager of the Pitcairn School of Aviation at Tulsa. Capt. A. K. S. will direct the flying activities of the school.

Philip A. Head, first lieutenant in the U. S. Army Air Reserve Corps and chief pilot of the Airways Transport Service will go to Maxwell Field, Montgomery, Ala., for a year of active service.

Orville Payson has joined the staff of instructors of the Sherrill School at Marion Mills on Cap. Col. May.

Ralph W. Wray, former manager of Akron, Ohio, is now in charge of the flying school of the Curtis Service at Indianapolis.

Neasey E. Jones has resigned his position as manager of the flying school of Bremo Aerobile Corporation of Bremo, Ga., to join the Marine Aircraft Company, Sanitito, Calif.

AERONAUTICAL CALENDAR

June 9-14 Webster, Tex., aviation meets. Director of Operations.

June 10-11 First National Air Yacht Cruise. Midwest Host Hotel, Inc., Inc.

June 21-22 Civil Air Patrol and International Air Cadet Program, various locations.

June 22-23 Chicago, Detroit, Buffalo, Tampa, Fla., and Miami.

June 23-25 National Air Show, Dayton, Ohio, and the National Air Show, Dallas, Tex.

June 25-26 Indianapolis, Indiana, International Air Show, Indianapolis, Indiana, and the Indianapolis Motor Speedway.

June 27-28 Ralph Atwood, Director of Operations, and George E. Hartman, Director of Personnel, General Motors Company, Detroit, Mich.

June 29-30 National Air Show, Dayton, Ohio, and the National Air Show, Dallas, Tex.

June 30 Ralph Atwood, Director of Operations, and George E. Hartman, Director of Personnel, General Motors Company, Detroit, Mich.

July 1-3 National Air Show, Dayton, Ohio, and the National Air Show, Dallas, Tex.

July 1-3 All-American Show, Detroit, Mich.

July 2-3 New York Signal, Robert Morris, Minneapolis, Minn., and the All-American Show, Detroit, Mich. Director of Operations, of Detroit, Mich., and the All-American Show, Detroit, Mich.

AVIATION September 26, 1938

New Firms Announced

Stevens Steam and Motor Company, Inc., New York, capital \$50,000, by James T. Egan, St. Regis Party, and Alfred E. Jernigan, to manufacture aircraft engines.

Aeronautical Engineers, Inc., 128 Broadway, New York, N. Y., capital \$10,000, by par value stock by Duke P. Hodges, Eugene T. Jones, John D. DeWitt, to deal in aircraft.

Blue Bird Liners, Inc., 300 Madison Avenue, New York, capital \$100,000, by John B. Linn and others.

Aeronautical Constructors of Canada, Ltd., Winnipeg, Manitoba, capital \$2,000 shares no par value preferred stock \$400 shares of common no par value.

Fairfax Aircraft Corporation, 909 Eighth Avenue, New York City, capital \$100,000, by Henry Farren, Frank M. Gould, and Robert F. S. Evans, to build aircraft using new designs, wings, engines, and landing gear.

Franklin Flying Service, Inc., of Jacksonville, Fla., capital \$100,000 with 2,000 shares of stock by C. W. Schildknecht, Thomas Quisen, and W. E. Lindley, to repair and test planes.

Schools and Colleges

Southern School of Aeronautics, successor of the Great Southern Aviation Corporation of Detroit, Mich., has been incorporated at the University of Southern California, Los Angeles, Calif. (Miss.) Municipal Airport.

McKinney Flying School, Tampa, Fla., has three considerable plane buildings recently being built on the coast of Pinellas.

Montana Flying Service, Missoula, Mont., has developed a civil plane flying school.

St. Louis-Universal Flying School, recently graduated the twenty students comprising its fourth classmate's class.

Paducah Southwest Airlines, Paducah, Ky., is being reorganized and will be known as the Southwest Airlines. The new name was chosen because the new line will be based at Paducah, Kentucky, and the Kinston Motor Company.

Lakeview Glider Institute, Lorain, Ohio, is to begin soon construction of a new hangar for the three gliders of Peter Herk.

Foxair Air College, East St. Louis, Ill., reports an increased enrollment in the Transport course.

Starts Weekly Service

MINNEAPOLIS (APRIL 2)—Weekly passenger service between St. Paul and Duluth, Minn., has been inaugurated by the hub-of-the-lakes Airways, Inc. A Ryan six-place monoplane with Wright J-6 Whirlwind engine, is to be used.

Air Travel Bureau Buoy

KANSAS CITY (APRIL 3)—A new high-speed air mail and passenger service between Kansas City and St. Louis, Mo., has been inaugurated by the Air Travel Bureau, which began service on April 1. The number of passengers carried by the Bureau totalled 4,957.

AVIATION September 26, 1938

AIRPORTS AND AIRLINES

Air-Rail Links Mexico and New York

NEW YORK (APRIL 1)—By merely re-arranging the schedules of existing trains and air lines, an air-rail service has been arranged between this city and Mexico City, starting Sept. 3. Along with the railroads, the arrangement is to consist of connecting trains and plane services, landing off from the main line. It is expected that the air-rail service, consisting of about 100 flights a week, will be in operation during the above period, the enclosed system (travelled 6024 mi. in July and 62,497 in August).

The latest agreement in the air-rail system involves the New York Central and the Mexican National City and State Railroads, the University of Mexico and Southern Air Transport (division of the Aeromexico Corporation) and the Mexican Aviation Company, a subsidiary of Pan American Airways.

Going south from this city, a passenger train will travel to the hub of the Southwestern Limited of the New York Central, arriving at Ciudad, at 6:30 a.m. on the next morning. Envigado, Chia, and Tuluá at 7:10 a.m. on Eastern time, and Cali at 8:15 a.m. on Eastern time. The return trip takes 9:05 and 9:45 for Envigado and Cali. From Envigado 10:00 and 11:15 for Cali. From Cali between 11:30 and 12:15 for Envigado. From the San-Luis-Atlanta, Cali, the passenger flies to Tolima on a Central Air Lines plane, arriving at 1:45 p.m. and arriving at Bogotá at 2:45 p.m. From Bogotá to the San-Luis-Atlanta, Cali, the passenger flies to Bogotá at 3:45 p.m. and arriving at 4:45 p.m. From Bogotá to Envigado at 5:45 p.m. and arriving at 6:45 p.m. At Envigado, Minas, Cali, and Envigado for Dulce, Cali, arriving at 7:30 a.m. The next day, the passenger flies to Bogotá at 8:45 p.m. and arriving at 9:45 p.m. From Bogotá to Envigado at 10:45 p.m. and arriving at 11:45 p.m. From Envigado to Bogotá at 12:45 a.m. and arriving at 1:45 a.m. From Bogotá to Envigado at 2:45 a.m. and arriving at 3:45 a.m. From Bogotá to Envigado at 4:45 a.m. and arriving at 5:45 a.m. From Bogotá to Envigado at 6:45 a.m. and arriving at 7:45 a.m. From Bogotá to Envigado at 8:45 a.m. and arriving at 9:45 a.m. From Bogotá to Envigado at 10:45 a.m. and arriving at 11:45 a.m. From Bogotá to Envigado at 12:45 p.m. and arriving at 1:45 p.m. From Bogotá to Envigado at 2:45 p.m. and arriving at 3:45 p.m. From Bogotá to Envigado at 4:45 p.m. and arriving at 5:45 p.m. From Bogotá to Envigado at 6:45 a.m. and arriving at 7:45 a.m. From Bogotá to Envigado at 8:45 a.m. and arriving at 9:45 a.m. From Bogotá to Envigado at 10:45 a.m. and arriving at 11:45 a.m. From Bogotá to Envigado at 12:45 p.m. and arriving at 1:45 p.m. From Bogotá to Envigado at 2:45 p.m. and arriving at 3:45 p.m. From Bogotá to Envigado at 4:45 p.m. and arriving at 5:45 p.m. From Bogotá to Envigado at 6:45 a.m. and arriving at 7:45 a.m. From Bogotá to Envigado at 8:45 a.m. and arriving at 9:45 a.m. From Bogotá to Envigado at 10:45 a.m. and arriving at 11:45 a.m. From Bogotá to Envigado at 12:45 p.m. and arriving at 1:45 p.m. From Bogotá to Envigado at 2:45 p.m. and arriving at 3:45 p.m. From Bogotá to Envigado at 4:45 p.m. and arriving at 5:45 p.m. From Bogotá to Envigado at 6:45 a.m. and arriving at 7:45 a.m. From Bogotá to Envigado at 8:45 a.m. and arriving at 9:45 a.m. From Bogotá to Envigado at 10:45 a.m. and arriving at 11:45 a.m. From Bogotá to Envigado at 12:45 p.m. and arriving at 1:45 p.m. From Bogotá to Envigado at 2:45 p.m. and arriving at 3:45 p.m. From Bogotá to Envigado at 4:45 p.m. and arriving at 5:45 p.m. From Bogotá to Envigado at 6:45 a.m. and arriving at 7:45 a.m. From Bogotá to Envigado at 8:45 a.m. and arriving at 9:45 a.m. From Bogotá to Envigado at 10:45 a.m. and arriving at 11:45 a.m. From Bogotá to Envigado at 12:45 p.m. and arriving at 1:45 p.m. From Bogotá to Envigado at 2:45 p.m. and arriving at 3:45 p.m. From Bogotá to Envigado at 4:45 p.m. and arriving at 5:45 p.m. From Bogotá to Envigado at 6:45 a.m. and arriving at 7:45 a.m. From Bogotá to Envigado at 8:45 a.m. and arriving at 9:45 a.m. From Bogotá to Envigado at 10:45 a.m. and arriving at 11:45 a.m. From Bogotá to Envigado at 12:45 p.m. and arriving at 1:45 p.m. From Bogotá to Envigado at 2:45 p.m. and arriving at 3:45 p.m. From Bogotá to Envigado at 4:45 p.m. and arriving at 5:45 p.m. From Bogotá to Envigado at 6:45 a.m. and arriving at 7:45 a.m. From Bogotá to Envigado at 8:45 a.m. and arriving at 9:45 a.m. From Bogotá to Envigado at 10:45 a.m. and arriving at 11:45 a.m. From Bogotá to Envigado at 12:45 p.m. and arriving at 1:45 p.m. From Bogotá to Envigado at 2:45 p.m. and arriving at 3:45 p.m. From Bogotá to Envigado at 4:45 p.m. and arriving at 5:45 p.m. From Bogotá to Envigado at 6:45 a.m. and arriving at 7:45 a.m. From Bogotá to Envigado at 8:45 a.m. and arriving at 9:45 a.m. From Bogotá to Envigado at 10:45 a.m. and arriving at 11:45 a.m. From Bogotá to Envigado at 12:45 p.m. and arriving at 1:45 p.m. From Bogotá to Envigado at 2:45 p.m. and arriving at 3:45 p.m. From Bogotá to Envigado at 4:45 p.m. and arriving at 5:45 p.m. From Bogotá to Envigado at 6:45 a.m. and arriving at 7:45 a.m. From Bogotá to Envigado at 8:45 a.m. and arriving at 9:45 a.m. From Bogotá to Envigado at 10:45 a.m. and arriving at 11:45 a.m. From Bogotá to Envigado at 12:45 p.m. and arriving at 1:45 p.m. From Bogotá to Envigado at 2:45 p.m. and arriving at 3:45 p.m. From Bogotá to Envigado at 4:45 p.m. and arriving at 5:45 p.m. From Bogotá to Envigado at 6:45 a.m. and arriving at 7:45 a.m. From Bogotá to Envigado at 8:45 a.m. and arriving at 9:45 a.m. From Bogotá to Envigado at 10:45 a.m. and arriving at 11:45 a.m. From Bogotá to Envigado at 12:45 p.m. and arriving at 1:45 p.m. From Bogotá to Envigado at 2:45 p.m. and arriving at 3:45 p.m. From Bogotá to Envigado at 4:45 p.m. and arriving at 5:45 p.m. From Bogotá to Envigado at 6:45 a.m. and arriving at 7:45 a.m. From Bogotá to Envigado at 8:45 a.m. and arriving at 9:45 a.m. From Bogotá to Envigado at 10:45 a.m. and arriving at 11:45 a.m. From Bogotá to Envigado at 12:45 p.m. and arriving at 1:45 p.m. From Bogotá to Envigado at 2:45 p.m. and arriving at 3:45 p.m. From Bogotá to Envigado at 4:45 p.m. and arriving at 5:45 p.m. From Bogotá to Envigado at 6:45 a.m. and arriving at 7:45 a.m. From Bogotá to Envigado at 8:45 a.m. and arriving at 9:45 a.m. From Bogotá to Envigado at 10:45 a.m. and arriving at 11:45 a.m. From Bogotá to Envigado at 12:45 p.m. and arriving at 1:45 p.m. From Bogotá to Envigado at 2:45 p.m. and arriving at 3:45 p.m. From Bogotá to Envigado at 4:45 p.m. and arriving at 5:45 p.m. From Bogotá to Envigado at 6:45 a.m. and arriving at 7:45 a.m. From Bogotá to Envigado at 8:45 a.m. and arriving at 9:45 a.m. From Bogotá to Envigado at 10:45 a.m. and arriving at 11:45 a.m. From Bogotá to Envigado at 12:45 p.m. and arriving at 1:45 p.m. From Bogotá to Envigado at 2:45 p.m. and arriving at 3:45 p.m. From Bogotá to Envigado at 4:45 p.m. and arriving at 5:45 p.m. From Bogotá to Envigado at 6:45 a.m. and arriving at 7:45 a.m. From Bogotá to Envigado at 8:45 a.m. and arriving at 9:45 a.m. From Bogotá to Envigado at 10:45 a.m. and arriving at 11:45 a.m. From Bogotá to Envigado at 12:45 p.m. and arriving at 1:45 p.m. From Bogotá to Envigado at 2:45 p.m. and arriving at 3:45 p.m. From Bogotá to Envigado at 4:45 p.m. and arriving at 5:45 p.m. From Bogotá to Envigado at 6:45 a.m. and arriving at 7:45 a.m. From Bogotá to Envigado at 8:45 a.m. and arriving at 9:45 a.m. From Bogotá to Envigado at 10:45 a.m. and arriving at 11:45 a.m. From Bogotá to Envigado at 12:45 p.m. and arriving at 1:45 p.m. From Bogotá to Envigado at 2:45 p.m. and arriving at 3:45 p.m. From Bogotá to Envigado at 4:45 p.m. and arriving at 5:45 p.m. From Bogotá to Envigado at 6:45 a.m. and arriving at 7:45 a.m. From Bogotá to Envigado at 8:45 a.m. and arriving at 9:45 a.m. From Bogotá to Envigado at 10:45 a.m. and arriving at 11:45 a.m. From Bogotá to Envigado at 12:45 p.m. and arriving at 1:45 p.m. From Bogotá to Envigado at 2:45 p.m. and arriving at 3:45 p.m. From Bogotá to Envigado at 4:45 p.m. and arriving at 5:45 p.m. From Bogotá to Envigado at 6:45 a.m. and arriving at 7:45 a.m. From Bogotá to Envigado at 8:45 a.m. and arriving at 9:45 a.m. From Bogotá to Envigado at 10:45 a.m. and arriving at 11:45 a.m. From Bogotá to Envigado at 12:45 p.m. and arriving at 1:45 p.m. From Bogotá to Envigado at 2:45 p.m. and arriving at 3:45 p.m. From Bogotá to Envigado at 4:45 p.m. and arriving at 5:45 p.m. From Bogotá to Envigado at 6:45 a.m. and arriving at 7:45 a.m. From Bogotá to Envigado at 8:45 a.m. and arriving at 9:45 a.m. From Bogotá to Envigado at 10:45 a.m. and arriving at 11:45 a.m. From Bogotá to Envigado at 12:45 p.m. and arriving at 1:45 p.m. From Bogotá to Envigado at 2:45 p.m. and arriving at 3:45 p.m. From Bogotá to Envigado at 4:45 p.m. and arriving at 5:45 p.m. From Bogotá to Envigado at 6:45 a.m. and arriving at 7:45 a.m. From Bogotá to Envigado at 8:45 a.m. and arriving at 9:45 a.m. From Bogotá to Envigado at 10:45 a.m. and arriving at 11:45 a.m. From Bogotá to Envigado at 12:45 p.m. and arriving at 1:45 p.m. From Bogotá to Envigado at 2:45 p.m. and arriving at 3:45 p.m. From Bogotá to Envigado at 4:45 p.m. and arriving at 5:45 p.m. From Bogotá to Envigado at 6:45 a.m. and arriving at 7:45 a.m. From Bogotá to Envigado at 8:45 a.m. and arriving at 9:45 a.m. From Bogotá to Envigado at 10:45 a.m. and arriving at 11:45 a.m. From Bogotá to Envigado at 12:45 p.m. and arriving at 1:45 p.m. From Bogotá to Envigado at 2:45 p.m. and arriving at 3:45 p.m. From Bogotá to Envigado at 4:45 p.m. and arriving at 5:45 p.m. From Bogotá to Envigado at 6:45 a.m. and arriving at 7:45 a.m. From Bogotá to Envigado at 8:45 a.m. and arriving at 9:45 a.m. From Bogotá to Envigado at 10:45 a.m. and arriving at 11:45 a.m. From Bogotá to Envigado at 12:45 p.m. and arriving at 1:45 p.m. From Bogotá to Envigado at 2:45 p.m. and arriving at 3:45 p.m. From Bogotá to Envigado at 4:45 p.m. and arriving at 5:45 p.m. From Bogotá to Envigado at 6:45 a.m. and arriving at 7:45 a.m. From Bogotá to Envigado at 8:45 a.m. and arriving at 9:45 a.m. From Bogotá to Envigado at 10:45 a.m. and arriving at 11:45 a.m. From Bogotá to Envigado at 12:45 p.m. and arriving at 1:45 p.m. From Bogotá to Envigado at 2:45 p.m. and arriving at 3:45 p.m. From Bogotá to Envigado at 4:45 p.m. and arriving at 5:45 p.m. From Bogotá to Envigado at 6:45 a.m. and arriving at 7:45 a.m. From Bogotá to Envigado at 8:45 a.m. and arriving at 9:45 a.m. From Bogotá to Envigado at 10:45 a.m. and arriving at 11:45 a.m. From Bogotá to Envigado at 12:45 p.m. and arriving at 1:45 p.m. From Bogotá to Envigado at 2:45 p.m. and arriving at 3:45 p.m. From Bogotá to Envigado at 4:45 p.m. and arriving at 5:45 p.m. From Bogotá to Envigado at 6:45 a.m. and arriving at 7:45 a.m. From Bogotá to Envigado at 8:45 a.m. and arriving at 9:45 a.m. From Bogotá to Envigado at 10:45 a.m. and arriving at 11:45 a.m. From Bogotá to Envigado at 12:45 p.m. and arriving at 1:45 p.m. From Bogotá to Envigado at 2:45 p.m. and arriving at 3:45 p.m. From Bogotá to Envigado at 4:45 p.m. and arriving at 5:45 p.m. From Bogotá to Envigado at 6:45 a.m. and arriving at 7:45 a.m. From Bogotá to Envigado at 8:45 a.m. and arriving at 9:45 a.m. From Bogotá to Envigado at 10:45 a.m. and arriving at 11:45 a.m. From Bogotá to Envigado at 12:45 p.m. and arriving at 1:45 p.m. From Bogotá to Envigado at 2:45 p.m. and arriving at 3:45 p.m. From Bogotá to Envigado at 4:45 p.m. and arriving at 5:45 p.m. From Bogotá to Envigado at 6:45 a.m. and arriving at 7:45 a.m. From Bogotá to Envigado at 8:45 a.m. and arriving at 9:45 a.m. From Bogotá to Envigado at 10:45 a.m. and arriving at 11:45 a.m. From Bogotá to Envigado at 12:45 p.m. and arriving at 1:45 p.m. From Bogotá to Envigado at 2:45 p.m. and arriving at 3:45 p.m. From Bogotá to Envigado at 4:45 p.m. and arriving at 5:45 p.m. From Bogotá to Envigado at 6:45 a.m. and arriving at 7:45 a.m. From Bogotá to Envigado at 8:45 a.m. and arriving at 9:45 a.m. From Bogotá to Envigado at 10:45 a.m. and arriving at 11:45 a.m. From Bogotá to Envigado at 12:45 p.m. and arriving at 1:45 p.m. From Bogotá to Envigado at 2:45 p.m. and arriving at 3:45 p.m. From Bogotá to Envigado at 4:45 p.m. and arriving at 5:45 p.m. From Bogotá to Envigado at 6:45 a.m. and arriving at 7:45 a.m. From Bogotá to Envigado at 8:45 a.m. and arriving at 9:45 a.m. From Bogotá to Envigado at 10:45 a.m. and arriving at 11:45 a.m. From Bogotá to Envigado at 12:45 p.m. and arriving at 1:45 p.m. From Bogotá to Envigado at 2:45 p.m. and arriving at 3:45 p.m. From Bogotá to Envigado at 4:45 p.m. and arriving at 5:45 p.m. From Bogotá to Envigado at 6:45 a.m. and arriving at 7:45 a.m. From Bogotá to Envigado at 8:45 a.m. and arriving at 9:45 a.m. From Bogotá to Envigado at 10:45 a.m. and arriving at 11:45 a.m. From Bogotá to Envigado at 12:45 p.m. and arriving at 1:45 p.m. From Bogotá to Envigado at 2:45 p.m. and arriving at 3:45 p.m. From Bogotá to Envigado at 4:45 p.m. and arriving at 5:45 p.m. From Bogotá to Envigado at 6:45 a.m. and arriving at 7:45 a.m. From Bogotá to Envigado at 8:45 a.m. and arriving at 9:45 a.m. From Bogotá to Envigado at 10:45 a.m. and arriving at 11:45 a.m. From Bogotá to Envigado at 12:45 p.m. and arriving at 1:45 p.m. From Bogotá to Envigado at 2:45 p.m. and arriving at 3:45 p.m. From Bogotá to Envigado at 4:45 p.m. and arriving at 5:45 p.m. From Bogotá to Envigado at 6:45 a.m. and arriving at 7:45 a.m. From Bogotá to Envigado at 8:45 a.m. and arriving at 9:45 a.m. From Bogotá to Envigado at 10:45 a.m. and arriving at 11:45 a.m. From Bogotá to Envigado at 12:45 p.m. and arriving at 1:45 p.m. From Bogotá to Envigado at 2:45 p.m. and arriving at 3:45 p.m. From Bogotá to Envigado at 4:45 p.m. and arriving at 5:45 p.m. From Bogotá to Envigado at 6:45 a.m. and arriving at 7:45 a.m. From Bogotá to Envigado at 8:45 a.m. and arriving at 9:45 a.m. From Bogotá to Envigado at 10:45 a.m. and arriving at 11:45 a.m. From Bogotá to Envigado at 12:45 p.m. and arriving at 1:45 p.m. From Bogotá to Envigado at 2:45 p.m. and arriving at 3:45 p.m. From Bogotá to Envigado at 4:45 p.m. and arriving at 5:45 p.m. From Bogotá to Envigado at 6:45 a.m. and arriving at 7:45 a.m. From Bogotá to Envigado at 8:45 a.m. and arriving at 9:45 a.m. From Bogotá to Envigado at 10:45 a.m. and arriving at 11:45 a.m. From Bogotá to Envigado at 12:45 p.m. and arriving at 1:45 p.m. From Bogotá to Envigado at 2:45 p.m. and arriving at 3:45 p.m. From Bogotá to Envigado at 4:45 p.m. and arriving at 5:45 p.m. From Bogotá to Envigado at 6:45 a.m. and arriving at 7:45 a.m. From Bogotá to Envigado at 8:45 a.m. and arriving at 9:45 a.m. From Bogotá to Envigado at 10:45 a.m. and arriving at 11:45 a.m. From Bogotá to Envigado at 12:45 p.m. and arriving at 1:45 p.m. From Bogotá to Envigado at 2:45 p.m. and arriving at 3:45 p.m. From Bogotá to Envigado at 4:45 p.m. and arriving at 5:45 p.m. From Bogotá to Envigado at 6:45 a.m. and arriving at 7:45 a.m. From Bogotá to Envigado at 8:45 a.m. and arriving at 9:45 a.m. From Bogotá to Envigado at 10:45 a.m. and arriving at 11:45 a.m. From Bogotá to Envigado at 12:45 p.m. and arriving at 1:45 p.m. From Bogotá to Envigado at 2:45 p.m. and arriving at 3:45 p.m. From Bogotá to Envigado at 4:45 p.m. and arriving at 5:45 p.m. From Bogotá to Envigado at 6:45 a.m. and arriving at 7:45 a.m. From Bogotá to Envigado at 8:45 a.m. and arriving at 9:45 a.m. From Bogotá to Envigado at 10:45 a.m. and arriving at 11:45 a.m. From Bogotá to Envigado at 12:45 p.m. and arriving at 1:45 p.m. From Bogotá to Envigado at 2:45 p.m. and arriving at 3:45 p.m. From Bogotá to Envigado at 4:45 p.m. and arriving at 5:45 p.m. From Bogotá to Envigado at 6:45 a.m. and arriving at 7:45 a.m. From Bogotá to Envigado at 8:45 a.m. and arriving at 9:45 a.m. From Bogotá to Envigado at 10:45 a.m. and arriving at 11:45 a.m. From Bogotá to Envigado at 12:45 p.m. and arriving at 1:45 p.m. From Bogotá to Envigado at 2:45 p.m. and arriving at 3:45 p.m. From Bogotá to Envigado at 4:45 p.m. and arriving at 5:45 p.m. From Bogotá to Envigado at 6:45 a.m. and arriving at 7:45 a.m. From Bogotá to Envigado at 8:45 a.m. and arriving at 9:45 a.m. From Bogotá to Envigado at 10:45 a.m. and arriving at 11:45 a.m. From Bogotá to Envigado at 12:45 p.m. and arriving at 1:45 p.m. From Bogotá to Envigado at 2:45 p.m. and arriving at 3:45 p.m. From Bogotá to Envigado at 4:45 p.m. and arriving at 5:45 p.m. From Bogotá to Envigado at 6:45 a.m. and arriving at 7:45 a.m. From Bogotá to Envigado at 8:45 a.m. and arriving at 9:45 a.m. From Bogotá to Envigado at 10:45 a.m. and arriving at 11:45 a.m. From Bogotá to Envigado at 12:45 p.m. and arriving at 1:45 p.m. From Bogotá to Envigado at 2:45 p.m. and arriving at 3:45 p.m. From Bogotá to Envigado at 4:45 p.m. and arriving at 5:45 p.m. From Bogotá to Envigado at 6:45 a.m. and arriving at 7:45 a.m. From Bogotá to Envigado at 8:45 a.m. and arriving at 9:45 a.m. From Bogotá to Envigado at 10:45 a.m. and arriving at 11:45 a.m. From Bogotá to Envigado at 12:45 p.m. and arriving at 1:45 p.m. From Bogotá to Envigado at 2:45 p.m. and arriving at 3:45 p.m. From Bogotá to Envigado at 4:45 p.m. and arriving at 5:45 p.m. From Bogotá to Envigado at 6:45 a.m. and arriving at 7:45 a.m. From Bogotá to Envigado at 8:45 a.m. and arriving at 9:45 a.m. From Bogotá to Envigado at 10:45 a.m. and arriving at 11:45 a.m. From Bogotá to Envigado at 12:45 p.m. and arriving at 1:45 p.m. From Bogotá to Envigado at 2:45 p.m. and arriving at 3:45 p.m. From Bogotá to Envigado at 4:45 p.m. and arriving at 5:45 p.m. From Bogotá to Envigado at 6:45 a.m. and arriving at 7:45 a.m. From Bogotá to Envigado at 8:45 a.m. and arriving at 9:45 a.m. From Bogotá to Envigado at 10:45 a.m. and arriving at 11:45 a.m. From Bogotá to Envigado at 12:45 p.m. and arriving at 1:45 p.m. From Bogotá to Envigado at 2:45 p.m. and arriving at 3:45 p.m. From Bogotá to Envigado at 4:45 p.m. and arriving at 5:45 p.m. From Bogotá to Envigado at 6:45 a.m. and arriving at 7:45 a.m. From Bogotá to Envigado at 8:45 a.m. and arriving at 9:45 a.m. From Bogotá to Envigado at 10:45 a.m. and arriving at 11:45 a.m. From Bogotá to Envigado at 12:45 p.m. and arriving at 1:45 p.m. From Bogotá to Envigado at 2:45 p.m. and arriving at 3:45 p.m. From Bogotá to Envigado at 4:45 p.m. and arriving at 5:45 p.m. From Bogotá to Envigado at 6:45 a.m. and arriving at 7:45 a.m. From Bogotá to Envigado at 8:45 a.m. and arriving at 9:45 a.m. From Bogotá to Envigado at 10:45 a.m. and arriving at 11:45 a.m. From Bogotá to Envigado at 12:45 p.m. and arriving at 1:45 p.m. From Bogotá to Envigado at 2:45 p.m. and arriving at 3:45 p.m. From Bogotá to Envigado at 4:45 p.m. and arriving at 5:45 p.m. From Bogotá to Envigado at 6:45 a.m. and arriving at 7:45 a.m. From Bogotá to Envigado at 8:45 a.m. and arriving at 9:45 a.m. From Bogotá to Envigado at 10:45 a.m. and arriving at 11:45 a.m. From Bogotá to Envigado at 12:45 p.m. and arriving at 1:45 p.m. From Bogotá to Envigado at 2:45 p.m. and arriving at 3:45 p.m. From Bogotá to Envigado at 4:45 p.m. and arriving at 5:45 p.m. From Bogotá to Envigado at 6:45 a.m. and

FOREIGN ACTIVITIES

Operations Reported
On Mexican Airways

MEXICO CITY (UPI)—During the last six months of the present year planes on the mail and passenger routes of Mexico have totalled 988,800 km. (611,357 mi.) and carried 1,020 passengers. The record for the year is 1,020 passengers on the 5,772 flights or 2,040 km. in distance covered and only 100 km. unclaimed by the department of airmail of the Ministry of Communications and Post. The Mexican Air Mail Company holds the big record of 2,563 passengers and 16,572 km. (10,294 mi.) covered during this time. The newly established routes of the Aeromaritime Transport Company, Aeromaritime, and the Aerovias Mexicanas on the Pacific, southern route 142 flights, using 24 planes and carried 113 passengers and 2449 km. of mail. Aeromaritime Aviation Company, planed 205 km. on 20 flights, 2,000 km. of airmail, 29 km. on 24 flights and 100 km. on planes. Fourteen planes and 260 pilots were used in other unannounced aviation enterprises from January to June. These planes made 2,453 flights and carried 1,020 passengers.

Figures and statistics in the department show that there was a record movement of unannounced planes at Yal Hauca, Uruapan, Puebla, during the week August 24-31. This week the record was for the destination and arrival of planes and passenger flights. 1,020 passengers were travelling the world. 3,627 km. (2,254 mi.) a flight 1,250 passengers carried. Fourteen planes were used in the Mexico City-Brownsville route and 6,278 km. Brown. Night trips were made on the Mexico City-Guadalajara line and 1,020 in this service, an average 5,570 km. Brown. Night flights were made on the Mexico City-Cuadillo Jalisco route, the planes, few 4,000 km. Nine practice flights were made. This was the best week the Mexico City airport has ever had.

Preparing For Distance Attempt

CRAVENHILL (UPI)—Another attempt to make a nonstop record is to be made this week under auspices of the Royal Flying Club. This time the same Flying Club long range monoplane, which recently was flown from here to Kandy, Ceylon, is to start from the same point on the 15th. On the last flight the machine was flown 4,130 km. The record is 4,453 km. established by Pfeiffer and Hulme from their flight from Rio to South America. Squadron Leader H. C. G. Pfeiffer, pilot, and Flight Lieutenant M. H. Jenkins, again will be the crew.

Will Attempt Altitude Record

MEXICO CITY (UPI)—With the present interest of climbing rigs of all kinds, the University of Detroit, and among to make an altitude of more than 40,000 ft. in a specially constructed balloon. The National Press Bureau for Scientific Research has been asked to help in the work, which is to be done in a about 600 ft. or 180 m. above sea in every case the experiment. The divided plans on the balloon have not been given, but it is said that several of a broken wire will have a close enough bridge to the main.

Morzic Wins Light
Plane Tour of Europe

PARIS (UPI)—French light-plane pilots at the 1929 International Light-Plane Tour, held at Le Bourget, 314 km. west of Paris, won the first place in the 1,000 km. race, flying a B.A. 10, 30 km. less than two place second, piloted with a 20 km. handicap, by a B.A. 10. The second place was won by a B.A. 10, 100 km. handicap, by a B.A. 10. Flying a B.A. 10, 100 km. handicap, was second with 400 km. points, although he made the fastest time around the course. Paul Carlier was third, with a total of 300 km. points. The fourth place was won by a B.A. 10, 100 km. handicap, piloted with a 100 km. handicap. Other class winners and three planes won French. Peter Lissner, in Germany, Klein, in Austria, and Soddy, in Sweden, also won. The Gavroche of Moulis, using a Romeo Ro 5 (15 hp. Fiat) got 127.25 points, with the Von Braun German flying plane, a close second. The 1929 International Light-Plane Tour, the results of which are printed elsewhere in this issue, are the result of 100 flights of the tour and in the total of August 17 and 24.—Ed.

In operations, the airplane is at great altitude and high speeds are attained of its speed. The average speed of the tour was 100 km. per hour. Major J. B. Major, British representative of the Royal Flying Club, said that the conditions so difficult that he thinks the record will be broken in the future. Pfeiffer and Jenkins, it is said, on the principle of the Cessna Autogiro which is to be represented was asked all the representatives

English Guggenheim
Entry Performs Well

LONDON (UPI)—The new British record for the highest altitude for the Douglas Guggenheim High Altitude Competition will be soon set by Aeromaritime and those who have set it by say it is less remarkable properties of slow flight at an unusual angle, in the opinion.

It has been designed by Hendry Page Ltd. and full advantage has been taken of the Hendry Page aeronautics idea of what remains lateral control of the aircraft. The aircraft has, however, so low that otherwise it would fall and spin into the ground. Its wings are more than usually well protected with slats, and in addition, there are vertical fins and rudders which will help to hold the aircraft in the slow flight under perfect control. The air plane has been photographed having the greatest air angle of about 45 degrees, so as to get the best lift. The fact is that the aircraft is so low that it could fall off the ground in such a position with perfect control indicates that a pilot when landing should be able to land it such a slow speed that the aircraft can be regarded as almost a glider.

In operations, the airplane is at great altitude and high speeds are attained of its speed. The average speed of the tour was 100 km. per hour. Major J. B. Major, British representative of the Royal Flying Club, said that the conditions so difficult that he thinks the record will be broken in the future. Pfeiffer and Jenkins, it is said, on the principle of the Cessna Autogiro which is to be represented was asked all the representatives



The Hendry Page-Guggenheim entry in flight.

AVIATION
September 14, 1929

Foreign News Briefs

MEXICO CITY (UPI)—The government of Mexico is planning to build a modern airport at Queretaro, the capital city.

An express in Mexico has been established over the express steamer by rail.

A glider has been built at the School of Navigation and Civil Aviation at Nogales, Mexico, according to plans furnished by the Mexican Association of Aeromaritime and the National Glider Association of the United States.

Plans are being prepared by the Mexican Department of Aeronautics of the Ministry of War and Navy for a flight in Los Angeles, Calif., to the Mexican capital by Capt. Luis E. Solar, one of the leading pilots of the Mexican army, and Capt. Luis M. Diaz, a Douglas pilot with a Bleriot.

Mexico is making extensive preparations for the reception of 1,020 km. passengers expected to visit that country on about 20 ceremonial flights during the last half of September. The planes will make a limited tour of promotional interest.

General Ernesto Martínez, one of the principal seaports in northern Mexico, is planning to build an airport which will be used to planes on the Tijuana, Mexico City, and Monterrey routes. Martínez and leading members of aircraft and automobile clubs in the city are to be shown at Monterrey on 100 miles with Aviation Week, which is to be held November 22-26, under the auspices of the Mexican Association of Aeronautics.

Major Modigliani of Italy has announced places to fly in November from Rome to Mex. May 10-15.

Under the auspices of the Aero Club of Prague there will be held at La Banda, Prague, on Sept. 20, 1930, an international meeting for flying boats and seaplanes and a contest for the Aero Club of France Cup. This will be held in a three-day period.

Akensberg Quits Flight to N. Y.

WILGUT (UPI)—Capt. Alfons Akensberg and Leopold Pfeiffer, flying a monoplane and a biplane, are to attempt to fly by stages from Stockholm to New York via Iceland and Greenland and Labrador, have announced the undertaking and have agreed to do it by Sept. 25, 1930. It is understood that they now consider unbreakable the existing record between Europe and North America, the theoretical value of which they had insisted to prove.

Mission to Toy Gliders

MEXICO CITY (UPI)—The sport of flying in planes without engines is soon to be introduced in Mexico. Plans for such planes have been received by the Mexican Aeronautic Association from the National Glider Association of the United States in response to a request from the Mexican organization

Mexican Airline Expanding

MEXICO CITY (UPI)—Corporacion Aeronautica de Transportes (Aeromaritime Transport Corporation) is to expand its operations in the United States, according to the 7th July of Los Angeles, already opened in this country. (See page 496, issue of August 21.) Ed. J. Rosas, operating from here to Ciudad Juarez, operates 21 Pass. Tex., with 100 km. to the north, Monterrey, and 100 km. to the south, Torreón. The company is to expand its cargo to 100 km. to the north, Monterrey, and 100 km. to the south, Tampico, in the near future, the company reports.

Build Caproni 97 C.
For Airline Operation

MILAN (UPI)—Forming a structural framework of high tensile strength steel tubing, forming a 200 km. aircraft, the first Caproni 97 C, is to be built for the Italian airline, which has been planned for airline operation. It has already been used, extensively, in Italian airfields and is to be used in the Italian Far East, which covers the Alps which offers a severe test of performance.

The plane is planned with one 140-hp. Isotta-Fraschini engine. The Caproni model 97 C is to be all-metal, all-surface aircraft, with a 120 km. per hour and is especially recommended for mountain flying, as it can fly with two engines out.

The model is a high-wing monoplane, with a span of 24 m. and a length of 10 m. The wings are of an all-metal construction, with ailerons which also serve to brace the wings against the downward pull of the aircraft model. The wheels are provided with brakes, a comparatively new feature.

Dimensions and performance figures follow: The capacity for the single engined plane is as follows:

Span	10.00 m.	Length	10.00 m.	Height	3.80 m.
Wing area	16.00 m ²	Wing load	100 kg/m ²	Wing load	100 kg/m ²
Wing load	100 kg/m ²	Wing load	100 kg/m ²	Wing load	100 kg/m ²
Wing load	100 kg/m ²	Wing load	100 kg/m ²	Wing load	100 kg/m ²

12.00 m.



SIDE SLIPS

By
Robert R. Osborne

*Annual Report of Side Slip's Special Correspondent
at the National Air Races*

(With special art by Mr. Billie Jacobson)

Dear Everett—I know you and the *Great Public* has been seriously wanting my report as to the Cleveland Air Races, so excuse you not knowing if you are in favor of them now! Hearing from me, Well, I wouldn't get to the show this year no more. I having a bit of a cold, plus regards a dog, and I am glad that Cliff Henderson and the boys were absent from the show now, as the *Cleveland People* must have been very sick. Visitors coming home from there will see there was bitter complaints from my cause of sources what had got goaded when the management had to admit it wouldn't be there and tried to say in Pittsburgh, Boulder, Williams, or where to divert their attention from this shortcoming. Well, Ed, I am sorry for a fellow can't be all over the map, except myself. Missiles and some things have to be in one's pocket, as best can.

I say by the papers that over 100,000 in the stands each day will tell a newspaper reporter were selling his paper almost 100,000 people in line to all points, on one day sends a bid out to count a parade as disaster, then over 2,000 people as it which is a large one. Well, I am glad the newspapers has an 100,000 as the standard for air races, as it means they is probably 20,000 people interested in air races, as a city can make one in the future without marginalizing the city, but we're racing down the politician path.

The papers also seems to be racing a lot of stories over the last concern the *Side Slip* which put on a show for the crowd was tied together with ropes as ribbons, as I had to state

that bats or the bats have been flying around the eye, which was tied together not only with ropes but binding wire, friction tape, telephone wire and clothes line. The Dept. of Civil has ordered these bats out of the air, as it is time they was more apprehensions for the *Airace* as *Stato*, so they could get better ships. But mind you some as the bats has ever used ribbon no matter how bad the bats may sound! He would say, "Bribes, what, and the H—, do you think this is a girls boarding school. Give me that there four pack an' I'll tell you that out of shape." Aviation has come to a pretty pass, I when the bats have going nothing can make them could like some face on there aircrafts what?

I understand from the news papers bats that may be on the loose, that as a result of this years races, new laws would not be a minute longer causing for planes as a starting standard for planes as a starting standard for two-motor transports. My suggestion would be also add a relativating endurance record for ships in inverted flight and regulations of the various designs in racing ships which has just about eliminated wings—sugget that all airplanes be required to have wings just for the principles of the thing. In-UK is in no need as all that has all ship should have wings even if they is not, but in the same case. We must keep some of our principles for the airplane sake.

Also read of a good idea as seen over—news from the *Side Slip* this year, all ships having navigability trees, in which they moves the ship on over night in the water so they holds the tree with the tree found

Yrs. Vt. Truly,
The *Side Slip* Aviator.

The WACO "165"

Photo courtesy Wright-Wichita, Wichita, Kansas
and the WACO Aircraft Corporation, Decatur, Illinois
Copyright 1939, Decatur WACO Aircraft Corporation
All rights reserved. Decatur WACO Aircraft Corporation
Decatur, Illinois



It's a great ship for commercial flying

FOR passenger hops and other commercial flying, you will find that the WACO "165" is in a class by itself.

Above all things else, for such service you want a ship that is absolutely dependable and has extra ruggedness—especially in its underpinnings. The "165" was designed with that in mind. It is one tough ship, built for knock-about service . . . stronger than necessary . . . in every detail. It will take an incredible amount of abuse.

And it is practical. It carries a dispensable load of 1070 lbs. on ten gallons of gas per hour at 105 m.p.h. cruising speed. It has flying qualities typically WACO . . . flies hands-off almost indefinitely . . . yet shows not the slightest tendency to sluggishness on the controls. And, like every WACO, it asks no favors of a landing field. You can sit down anywhere with it . . . and hop out again just as easily.

We'd like you to know more about the WACO "165" and its many exceptional features. Send for the new book that gives full details and specifications. Write for your free copy . . . today.

THE WACO AIRCRAFT COMPANY
Troy, Ohio



"ASK ANY PILOT"

**Oil
companies
choose
BOEING
planes □ □**



Started off Company's Building with fuel control. The jumbo engine and fuel for the tanks. Harness complete.

Section 106 Community Review, 100, 500-501

LARGE compressors buy equipment to prove efficiency and guaranteed not unusual performance. They, like the five large air and oxygen units which use Boiling equipment to move half the research air, much prefer "three-day-a-week planes."

The purchase of Boeing Model 49 by such companies as Standard Oil of California, Associated Oil and Engle Oil, is another endorsement of the superiority of the Boeing combination aircraft system alone.

Urgent performance has been sharply demonstrated by more than 100 million miles of scheduled flying on the transcontinental and Pacific Coast air mail, express and passenger routes in

the last two years, under conditions varying from sea level to 12,000 feet, and from sub-tropic to tropical temperatures.

Many distinctive Boeing features make Model 40-Bd the ideal plane for many individuals and companies transporting company executives, relatives or merchandise to branch houses, emergency diagnosis, newspapers, advertising purposes, moving men and materials to ports, lumber, coal, live stock, etc.

Performance specifications of 40-50, and other models from this, the largest implant factory in America, are given below. Write us for complete details on our various planes.

BOEING AIRPLANE CO.
SEATTLE, WASHINGTON

SEATTLE • • • WASHINGTON
Division of United Aircraft and Transport Corporation

Barrett Offers the Following Models for Early Delivery:

Planning Tools and Planning Models for Early Braking: A Literature Review from 1990 to 2000

only 15 minutes from Manhattan

**the
NYAT AIRPORT**
*at North Beach, Queens.
Now in operation for Seaplanes*

CLIMBING grimly down into the smooth, protected waters of Bowery Bay, your engine comes to a halt at the New York Air Terminal anchorage, or backs up on the wide ramp. Alighting, you boards this speed cruiser, and are whizzed out into the broad channel of the East River. Fifteen minutes later you are ashore at East 22nd Street, Manhattan.

That really is the problem of a Marine Flying Base in the metropolitan area is solved. New York Air Terminal, Incorporated, by locating a convenience pier near the sky basis of New York, provides ready accessibility, combined with excellent storage facilities. Fuel, oil and supplies are instantly available. Space for air planes and anything else will be found, whether for an overnight visit or permanent occupancy. Skilled mechanics are on hand to maintain and repair aircraft. By far the greatest flying field of about 200 miles will be available. . . . Whether you are a sportswoman, a business man, a flying passenger, the operator of a passenger transport line, or a distributor needing a local facility for demonstration, the New York Air Terminal, Airport at North Beach, Queens, invites you to avail yourself of the port's facilities. Come and make a personal inspection. For the smooth operation of finding a passenger airplane line, now using the port as a base, Our speed aviation operates on regular schedules from East 26th Street, or there is easy access by way of the 59th Street Bridge.

For those who are unable to exercise a personal right, we have prepared **Pattern 411**.

NEW YORK AIR TERMINALS
INCORPORATED
367 WEST 46th STREET, NEW YORK

307 WEST 49th STREET, NEW YORK



Distributors for
These Famous Airplanes



TRAVEL AIR
INCORPORATED
GURUOLIC CANTER HOPPERLERS
AND OPEN AIRPLANES

AVRO AVIATION

SPITFIRE LANDING

MURKIN

WING

Mont Peasant Scott
Pilots in England

Authorized Wright Dealer and Service Station

Also a complete course of flying instruction

AEROFACULTURE

LEXINGTON PHILADELPHIA FLYING SERVICE, INC.
PHILADELPHIA AIRPORT

Operating from

CENTRAL AIRPORT CAMDEN

Your eyes and air sense say
LUXOR GOGGLES

World's famous
airmen prefer
them for flying
and racing
S. S. Fifth Avenue, New York

YANKEE
RADIAL AIR-COOLED
ENGINES

175- 250 H.P.
175- 225 H.P.
175- 125 H.P.

Efficiency
Dependability
Convenience of
Service

E. G. PEASE
Controller Express
75 West St., N. Y. C.
General Distributors
SERVINS & PEASE, A. G.

S. S. White
Flexible Shafts
for
Tachometer Driving
and other
Power Transmission

Made by the largest producer
of steel wire flexible shafts

The S. S. White Dental Mfg. Co.

Industrial Division

151 West 45th St. New York, N. Y.

Telephone: BROAD 4-2244

TELEGRAMS: S. S. WHITE

TELETYPE: S. S. WHITE



We'd like to have you well acquainted with the IDECO line. IDECO is many and broad hangars, short, efficient construction, steel frame, steel roof, steel floor, steel walls and interior walls. Such is the nature of planning and building such equipment. IDECO hangars are at your service. Write for information.

The International Derrick & Equipment Co.,
Columbus, Ohio
Los Angeles, Calif.



"Opportunity" Advertising:
Think "SEARCHLIGHT" First!



AVIATION
September 26, 1929



LIGHT WEIGHT

SPECIALLY designed for airplanes, the BENDIX Wheel and BENDIX 2-Shoe Servo Brake form a single unit—sturdy, efficient, compact.

The 30x5 inch size weighs 22½ pounds complete with brake.

Price as produced is standard.

Only produced by process used exclusively in U. S. and abroad.

BENDIX BRAKE COMPANY
General Offices and Plant: South Bend, Ind.
Subsidiary of BENDIX Aviation Corporation, Chicago

BENDIX **BRAKES**
FOR AIRPLANE



AVIATION
September 26, 1929



STEEL HANGARS

- PERMANENT •
- FIRE-PROOF •
- LOW COST •

The broad and practical experience of this corporation gained over a period of years in the construction and erection of steel buildings has been applied with equal success to the building of modern hangars. Due to large and experience in building modern hangars is at your disposal.

The Thomas & Armstrong Company
Airplane Hangar Division
LONDON, OHIO



BOYCE MOTO METER

MacBride Gauge & Equipment Corporation offer a complete line of airplane heat indicators, oil pressure and air pressure gauges.

Long experience in the manufacture of these instruments, coupled with large production, makes it possible to offer high grade instruments at reasonable prices. Write now for free catalog to secure the dependability of these instruments.

Heat Indicators
Pressure Gauges



Part Pressure Gauge
Part Pressure Gauge
Part Pressure Gauge



MotoMeter Gauge and Equipment Corporation
2 Willow Avenue, Long Island City, N. Y.

U SPECIAL AVIATION PISTON S RINGS

Used	Aeronautic Allis	Castrol Ferris Allison	Parish & Whitney Worrell Wright and Many Others
Age	Aerospace Allison	Aerospace Cessna	Castrol Ferris Parish & Whitney Worrell Wright and Many Others

See full page advertisement in previous issue of
Aviation, October, November, December, January.

U. S. Standard Piston Ring Co., Passaic, N. J.

Cunningham-Hull Airplanes

All-metal structure — insures durability, lower maintenance and greater safety

Manufactured by
**CUNNINGHAM-HULL
AIRCRAFT CORPORATION**
13 Canal St.
ROCHESTER, NEW YORK

**The Budd
Wheel Company**

Makers of
Wheels for airplanes

PHILADELPHIA AND DETROIT



TIMM AIRPLANE CORP.
901 N. San Fernando Rd.
Glendale, Calif.

Aluminum Fuel and Oil Tanks

"Tank up with the leaders!"

Lightest aluminum welded tank per gallon—most durable—highest safety factor. Prices in range with commercial aviation.

See our exhibit at the Cleveland Show, Booth 227

Streloff-Naughton CORPORATION

20 Williams Street, Long Island City, N. Y.
Telephone, BEEchwood 1-0483

PITCAIRN AIRCRAFT



For Air Mail use SUPER MAILWING

For Sport or Private use SPORT MAILWING

PITCAIRN AIRCRAFT, INC.
Bronx Aerea, New York



LANDING LIGHTS

14 inch, double illuminated, 25-41
16 inch, double illuminated, 25-41
24 inch, double illuminated, 25-41
With the power of Cables 1/2"

Nicholas-Beazley
Airplane Company Inc.
Manufacturers of
WING BRACE

WESTERN BRANCH—2010 Wilshire Ave., Los Angeles, Calif.

Used and Surplus Equipment

INDIVIDUAL items of used equipment, or surplus new equipment, or composite plans, are disposed of (and found) through advertising in the *Searchlight* Section of this paper.

Use the Cleveland which is effectively the center of the country. In effect the many millions of dollars worth of surplus aircraft and equipment accumulated during the war without destroying the market.

"SEARCHLIGHT"

SEAMLESS STEEL TUBING

All Aircraft Grade

WAREHOUSE STOCKS for immediate shipment in any quantity.

BILL SHIPMENTS for substantial production requirements.

SERVICE STEEL COMPANY

144 FRANKLIN STREET
DETROIT 2, MICHIGAN
1415 15TH ST., CLEVELAND
120 W. ALMADA ST., LOS ANGELES

BENT-WOOD WING ENDS UNLAMINATED

We bend wing ends and other curved parts of solid wood, with strength, durability and impression qualities and at prices below those of laminated wood.

One bending experience of 50 years
is at your service.

H. G. SHEPARD & SONS,
New Haven, Conn.

ONLY
CAVALIER
OFFERS SUCH UNUSUAL
PERFORMANCE
WITH COMFORT AND ECONOMY



Greatest speed range...finest appointments and construction...and now available for delivery...See the nearest dealer or write for complete information.

Star Aircraft Co.
BARTLESVILLE, OKLAHOMA

A NOTRUS HANGAR



Was selected by
Great Lakes Aircraft Corporation
because of its quick and economical erection
made possible by linking together standardized
structural units. This and other factors determine
the popularity of the Notrus Hangar for all
existing conditions.

Save a flight. Write for Bulletin.
NOTRUS HANGAR CORP.
HOUSTON, TEXAS
S. L. Johnson
Gen. Mgr.
Box 1000
Notrus Corp.
Notrus Corp.
Notrus Corp.

A complete motor overhaul service



We offer complete and expert service for the
overhaul of all aircraft engines. We specialize
in the overhauling of Pratt & Whitney, Wright, and
Merlin engines. We have a complete line of
parts and accessories for all makes of aircraft
engines. Our motto is "Service Before Sale".

Thompson Aeronautical Corp.
CLEVELAND AIRPORT

"Save by using Cheney-Cast Cylinders"

In these days when production is at a standstill, the general public is anxious to know what can be done to help make
things important to better make
things.

An announcement of the power
of Cheney-Cast Cylinders
as applied to your machinery
will be of great interest to you.
The Cheney-Cast Cylinders
are unique in their construction
and are available in every
size and type required.

S. Cheney and Son
Manlius, N. Y.

Who are They?

William H. Miller, 6107 of Research,
assigned as an assistant to research project
of the Bureau of Standards, and research
of J. T. and son, research of Corrosion
research laboratory. Bill P. Devere,
assigned as an assistant to research project
of the Bureau of Standards, and research
of Corrosion research of the Corrosion
research laboratory. Robert G. Nichols
of R. G. Nichols.

BERLINER-JOYCE
AIRCRAFT CORPORATION
BALTIMORE
MAILED

KITTY HAWK Landing Gear

A wood landing gear which
is made to withstand the shocks of hard landing, and will
not break or split. It is made of solid wood, and is the
best material for shock absorbing.

It is a combination of the
best qualities of wood and
metal, and is the best landing gear
for the price.



WHERE TO FLY

FLY WITH US
 We design and build our own aircraft. We have a wide variety of aircraft available to include which can be used for the lowest cost to obtain.
 Part of your personal education in aviation is that you learn which new aircraft are best suited to your needs.
 If you are interested in reading a complete aircraft catalog and Price Sheet, you can receive one free, or write for information.
 Real Information, Without any fees;
 Just like the pros act.
Edgewater Flying Club, Inc.
 3120 Edgewater Avenue, Chicago, Illinois.

An advertisement for the All Tech School of Aviation. The top half features a black and white illustration of a biplane in flight. The bottom half contains text: 'ALL TECH SCHOOL OF AVIATION', 'Aviation for Commercial Purposes', and 'All Tech School of Aviation' repeated below. A large black 'X' is drawn across the entire advertisement.

FOR
GUNNERS
IN THE AIR
WE ARE
WITH YOU

CONTINENTAL

Introducing the Flying Train
the Inter-Cont. Express
from New York to Europe
by air. The latest present
of science has been used to its
best advantage.

CONTINENTAL
AIR SERVICES

Subsidiary
5450 West Euclid, Cincinnati

An advertisement for a flight school. It features a black and white photograph of a man in a flight uniform, including a cap with wings, looking towards the camera. Below the photo, the text reads: "Complete Air and Ground School", "TRAVERS AIR AND GROUND SCHOOL", "EXPERIENCED INSTRUCTORS", "PROFESSIONAL CAPITAL AIR INSTRUMENTS", and "100 Miles from Penn State, State College, Pa.".

FOR INFORMATION REGARDING FLYING
SCHOOLS
LOOK IN THE 'WHERE TO FLY' SECTION
OF 'AVIATION'
YOU CAN ASCERTAIN AT A GLANCE THE
BEST SCHOOLS THROUGHOUT
THE COUNTRY

Information also available from
SEARCHLIGHT DEPARTMENT, Truth Ave. at 10th St., New York

WHERE TO FLY

An advertisement for Parks Air College. It features a black and white photograph of a biplane in flight. Below the plane, a young man in a flight suit and goggles is shown, holding a control stick. The text "PARKS AIR COLLEGE" is written in large, bold, serif capital letters across the top of the ad. Below the plane, the text "CIVILIAN PILOTS AND AIRCRAFT OWNERS" is written in a smaller, sans-serif font. At the bottom, the text "PARKS AIR COLLEGE 304 N. 3rd, Toledo, Ohio" is displayed.

NEW YORK CITY
LEARN TO FLY
At a CURTISS SCHOOL

 The new Curtiss course is an easy study. It is planned for young boys by airmen and military experts. It is taught in a simple, easy-to-understand way. It is intended mainly for boys who have taken the special Curtiss "Instructor" Course. At this special aviation course, just the essentials of flying are taught, including the latest and most advanced flying. At the present time the first class is opening and preparing groups for a high place, as the recognized leaders of aviation.

CURTISS FLYING SERVICE

**FOR SUPERIOR
FLYING INSTRUCTION**

Raven Rock
Flying School

Pittsfield, Mass.
(at Shirley Middle School)

**THE PERFECT
TAKE-OFF FOR YOUR
FLYING CAREER.**

ROOSEVELT
AVIATION SCHOOL

Albertville, Minnesota —
Approved by the Civil Aeronautics
Board, the Flying Club,
the Flying Instructors
and the Flying Students
are all invited to
drop in, have a look around
and estimate just how
it is to be a pilot.

R

An advertisement for Embry-Riddle Approved Flying School. The top half features a large, bold, stylized font with the words 'APPROVED' and 'FLYING SCHOOL!' stacked vertically. Below this, a smaller section of text reads: 'One of the best schools in the United States is operated by the Dept. of Commerce for all types of aviation courses. Write today and receive free 'Write for descriptive circulars.'

APPROVED
FLYING SCHOOL!

One of the best schools in the United States is operated by the Dept. of Commerce for all types of aviation courses. Write today and receive free 'Write for descriptive circulars.'

EMBRY-RIDDLE
Canton, Illinois, U.S.A.

STULTZ FIELD
Tipton, Pa.

Four Way Field
20 acres
Complete privacy and screened grounds
and houses. All modern conveniences.
All buildings, including hangars, completely
equipped. Write for details.
Alhers Aircraft Corp.
Tipton, Pa.
Engines, Propellers, Fuel Cells, Filters,
Service, Standard-DeHavilland, DeHavilland
Cessna, Beech, Stinson, etc.

ALPHABETICAL INDEX TO ADVERTISEMENTS

SEARCHES

Classified Advertising	
GENERAL OPPORTUNITIES	41
POSITION VACANT	41
POSITION WANTED	41
USED AND SURPLUS EQUIPMENT	41-42

American Economic Review

International Survey

Introducing

Introducing Oxweld No. 21 High Strength

Oxweld No. 21 High Strength Bronze Welding Rod

SUPERIOR for all bronze-welding operations—equally adaptable for steel, cast iron or copper alloys—produces a sound, fine-grained weld metal of superior qualities of strength, toughness, ductility and freedom from porosity.

Oxweld No. 21 High Strength Beams Welding Rod requires less time to apply and less oxygen and acetylene. It makes high strength beams easier and cheaper.

This new rod is easily worked. It can be more rapidly tinned on a steel or cast iron surface. It has a low melting point—melts and freezes quickly and evenly. Remelting has no effect on either the quality or appearance of the finish work.

Ask any Oneweld representative for the whole story. Or, just order a supply from the nearest Oneweld warehouse.

OWNED ACETYLENE COMPANY

OXWELD ACRYLICENE COPOLYMER

2019 年度中国科学院植物研究所
植物学报 2020 年第 4 期

AT&T RING **DELL** **CHARTERS**
Cable and Cellular WiFi

SAN FRANCISCO

Adam Green Building

IN CANADA: German Oxygen Company, Toronto

STOCKS IN THE CITIES

HE WHO GOES ALOFT TODAY— WILL GET HIS FRIENDS TO FOLLOW!



HE public's knowledge of flight is largely second-hand — its interest is all too much "for the other fellow." The speed of flying, the safety of planes, the endurance of good engines has been repeatedly proven. But 110,000,000 Americans are on the ground instead of riding the air.

Some of course will never go up. Thousands will go once and remain anchored to earth thereafter. But still other thousands upon thousands will think with delight of their glorious, practical adventure and repeat and repeat.

Aviation will grow as its "First Flight Club" grows. And the way to spin out the miles . . . to build better motors . . . and more able planes . . . is to bring flying within the reach of *all* the earth-bound—to encourage by word, by deed, and by opportunity given, the millions who ought to fly but do not.

For the true day of aviation dawns when the ownership of a plane is a serious and sensible question . . . when a man and his family choose the make and model best suited to their needs . . . as today they choose an automobile.

Wright seeks to place flying on a practical, business basis. So that all can make their first flight in utter confidence . . . in a knowledge that everything is shipshape and secure . . . from Whirlwind engine to tail skid.



WRIGHT
AERONAUTICAL CORPORATION
PATERSON, NEW JERSEY

